Operating Instructions

S-VHS VHS PAL Hi-Fi

625

Video Cassette Recorder

Model AG-7500-A -B -E

Panasonic

Before attempting to connect, operate or adjust this product, please read these instructions completely.

VQT2882-1

FOR YOUR SAFETY

IMPORTANT

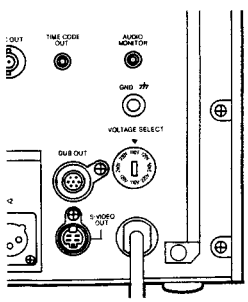
"Unauthorized recording of copyrighted television programmes, films, video tapes and other materials may infringe the right of copyright owners and be contrary to copyright laws."

CAUTION:
TO PREVENT FIRE OR SHOCK HAZARD AND ANNOYING INTERFERENCE, USE THE RECOMMENDED ACCESSORIES ONLY.

■ **THIS APPARATUS MUST BE EARTHED.**
To ensure safe operation the three-core lead supplied (not for U.K. model) must be connected only into a standard three-pin power point which is effectively earthed through the normal household wiring.
Extension cords used with the equipment must be three-core and be correctly wired to provide connection to earth. Wrongly wired extension cords are a major cause of fatalities.
The fact that the equipment operates satisfactorily does not imply that the power point is earthed and that the installation is completely safe. For your safety, if in any doubt about the effective earthing of the power point, consult a qualified electrician.

■ **DO NOT REMOVE PANEL COVER BY UNSCREWING.**
To prevent electric shock, do not remove cover. No user serviceable parts inside. Refer servicing to qualified service personnel.

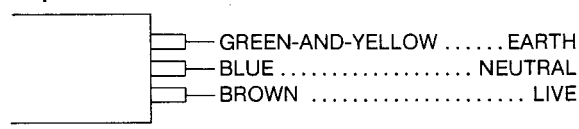
■ **VOLTAGE SELECTOR SETTING**



The power cord must be disconnected from mains before the voltage selector setting is changed.
AG-7500 can be used on either 110, 120, 220, or 240V AC.
AG-7500-E is preset to 220V at the factory. AG-7500-A and -B are preset to 240V at the factory.
Before connecting to the power supply, ensure that the selector on the rear panel is selected to the same voltage as your local power supply.
The voltage selector can be adjusted, if necessary, by using a screwdriver, but this adjustment must be made after disconnecting the power cord.

■ **AC POWER CORD CONNECTION (AG-7500-B only)**
The wires in the mains lead for this apparatus are coloured in accordance with the following code.

Important



Mains Lead

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows:
The wire which is coloured GREEN-AND-YELLOW must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol or coloured GREEN or GREEN-AND-YELLOW.
The wire which is coloured BLUE must be connected to the terminal which is marked with the letter N or coloured black.
The wire which is coloured BROWN must be connected to the terminal which is marked with the letter L or coloured red.

Remark:
This apparatus was produced to BS 800: 1983.
Dieses Modell entspricht der EG-Vorschrift (für Funkstörungsschutz) 82/499/EG.
La Société PANASONIC-FRANCE, importateur du matériel MATSUSHITA-JAPON déclare que cet appareil est conforme aux prescriptions de la directive 76/889/C.E.E. modifiée par la directive 82/499/C.E.E.
Dit model is onderworpen aan de EEG-richtijn (ter voorkoming van radio-interferentie) 82/499/EEG.
Denne model opfylder EF direktiv 82/499/EF (for forebyggelse af radiointeferens).
La Società PANASONIC ITALIA S.p.A., importatrice di questo prodotto, dichiara che questo apparecchio è conforme alle disposizioni della direttiva C.E.E./82/499 (D.M. 10 aprila 1984).

WARNING: TO PREVENT FIRE OR SHOCK HAZARD DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

is the safety information.

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INSPECTION

Standard Accessory

- S-VIDEO Cable (4P) (VJA0510)

Optional Accessories

- S-VIDEO Cable (4P) (AG-C71A...5m) (AG-C70A...3m)
- Dubbing Cable (7P) (AG-C65)
- Editing Controller (AG-A750/AG-A650/NV-A500/NV-A960)
- Remote Search Controller (NV-A505)
- Remote Controller (AG-A600)
- Rack Mount Adaptor (AG-M750)

OUTLINE

The model AG-7500 Editing Video Cassette Recorder has been developed for industrial applications, as well as for schools and studios.

By the use of the S-VHS system, a sharp picture with high resolution is obtained. Advanced editing and easy operation is realized by the introduction of high reliability mechanisms including the two-reel motor drive system, DD cylinder, and DD capstan.

By connecting the AG-A750 Editing Controller to the AG-7500, you can fully utilize the editing functions of the AG-7500 and perform more accurate editing by automatic operation. You can also create an editing system by connecting the unit to the AG-A650, NV-A500 or NV-A960 Editing Controller.

FEATURES

1. Amorphous heads and high quality picture

Picture quality has been improved by the use of the S-VHS system and the amorphous heads. Resolution of over 400 lines and less noise are realized in the following conditions.

- FM carrier frequency: White peak; 7 MHz
  Sync tip; 5.4 MHz
- Installation of sub-emphasis circuit
- White clip level: 210 %
- Use of S-VHS tape

2. Use of digital YC separator circuit

- Perfect YC separation is possible even in noncorrelating portions.
- Because of burst PLL system, non-standard signals can be separated, too.
- As digital signals are process, YC can be separated with small temperature or characteric changes by a stable operation.

3. Time Code Editing

The unit allows the execution of time code editing when this unit is connected to the AG-A750 Editing Controller. Synchronization is also possible at the Edit IN point by the Capstan Override Connector.

4. High precision linear audio editing timing

When insert or assemble editing, it is possible to edit at the linear audio editing timing of ±1 frame with respect to the video recording timing. (When using AG-A750.)

5. Automatic back space function

By the automatic back space function, video and audio data without blank portions can be recorded by splicing.

6. H-aligned framing servo

Sometimes, when editing video signals conforming to the CCIR standard, frame phase misalignment or horizontal distortion occurs between adjacent edited portions. This unit employs a framing servo to align the frames, thus eliminating such errors at the edit start and end points.

7. Flying erase-based editing

The adoption of a "rotary erase head" makes it possible to achieve top-grade electronic editing without noise or frame mis-synchronization.

8. Dual audio channel·Dolby* NR system

Because there are two normal audio tracks, stereo or bilingual programmes can be recorded and played back. The sound quality is further improved due to the built-in Dolby NR system.

* 'Dolby' and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.
* Noise reduction manufactured under license from Dolby Laboratories Licensing Corporation.

9. Recording and playback of Hi-Fi sound (HD sound) and assemble editing

You can record and play back HD Sound even without a video input signal. You can also independently record a total of four channels, that is, HD Sound (CH1/CH2) and Normal Audio CH1/CH2.

10. JOG/SHUTTLE search function using dial

A programme segment on the tape can be rapidly and accurately found by using the SHUTTLE search in which the tape speed is varied between 0 and 10 times the normal speed, or the JOG search in which the tape speed is varied in accordance with the rotational speed of the dial.

11. Field still function

This function provides attractive still pictures with minimal jitter.

12. Rack mounting possible due to front loading

The unit is a cassette tape insertion type employing front loading, hence it can be easily installed in an IEC standard 19-inch rack.

13. Editing and dubbing connectors

Special connectors designed for dubbing provide improved picture quality when dubbing or editing between video recorders.

14. Time code recording and playback

The EBU time code can be recorded and played back on the audio CH2 track.

15. Independent editing

When the AG-7500 is used independently as an editor and the edit start and end points are memorized in the tape counter, editing automatically takes place between those points.

16. System editing

An editing system can be configured by connecting the AG-7500 to an Editing Controller.

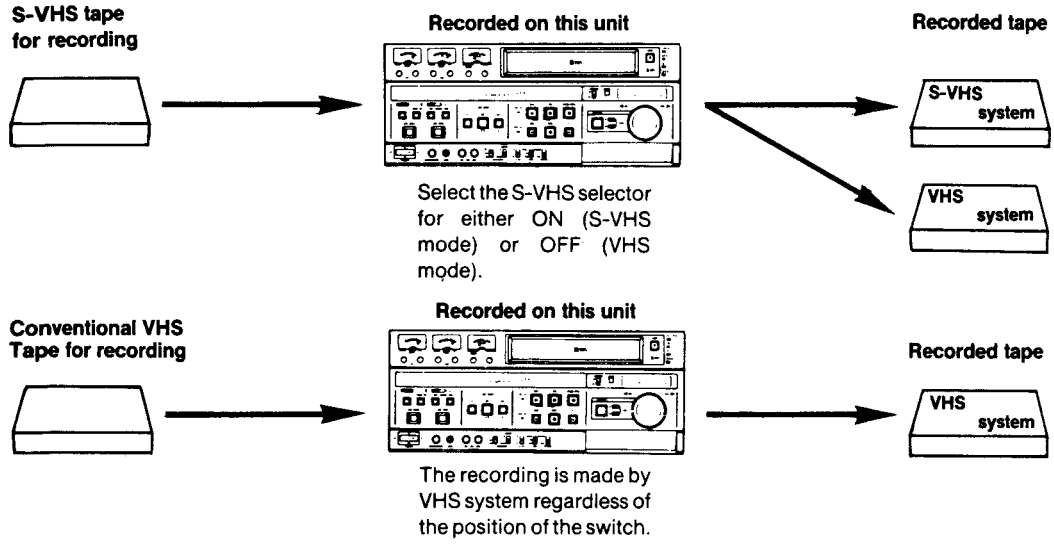
- Up to three source (playback) units can be connected simultaneously by using a Remote Search Controller (NV-A505, option).
- It is possible to configure a system by connecting the unit to the AG-A750, AG-A650, NV-A500 or NV-A960 Editing Controller (options).

S-VHS System

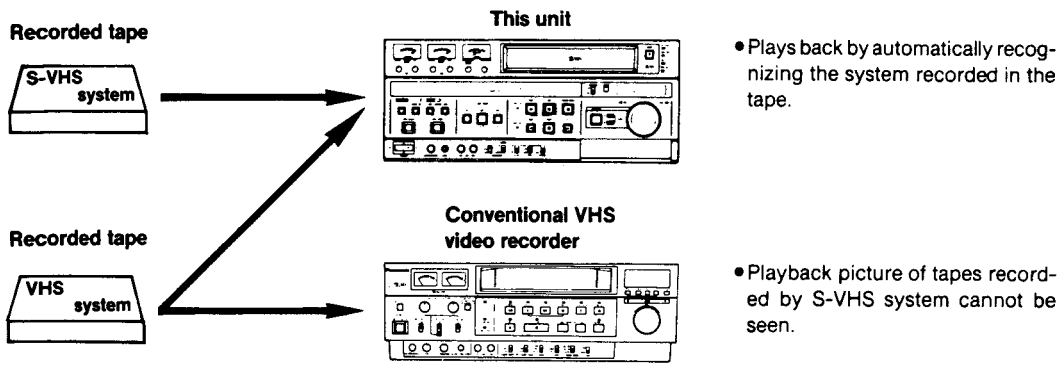
The S-VHS System has been designed to meet the critical demands of the Video Information Age. This system incorporates technologies that provide high resolution and excellent picture quality with the VHS Video system, which is solidly established the world over for industrial and home use.
The combination of this system with the newly developed S-VHS video cassette has enabled epoch-making progress in picture clarity and detail. The system produces a horizontal resolution of no less than 400 lines.
You can not only make recordings and playbacks of high quality pictures by using a video cassette with the S-VHS mark but also enjoy recording and playback as before with a cassette bearing the VHS mark.

Interchangeability of Video Recorders and Cassettes

During recording


S-VHS tape for recording
Recorded on this unit
Recorded tape
S-VHS system
VHS system
Select the S-VHS selector for either ON (S-VHS mode) or OFF (VHS mode).
Conventional VHS Tape for recording
Recorded on this unit
Recorded tape
VHS system
The recording is made by VHS system regardless of the position of the switch.

During playback


Recorded tape
S-VHS system
This unit
• Plays back by automatically recognizing the system recorded in the tape.
Recorded tape
VHS system
Conventional VHS video recorder
• Playback picture of tapes recorded by S-VHS system cannot be seen.

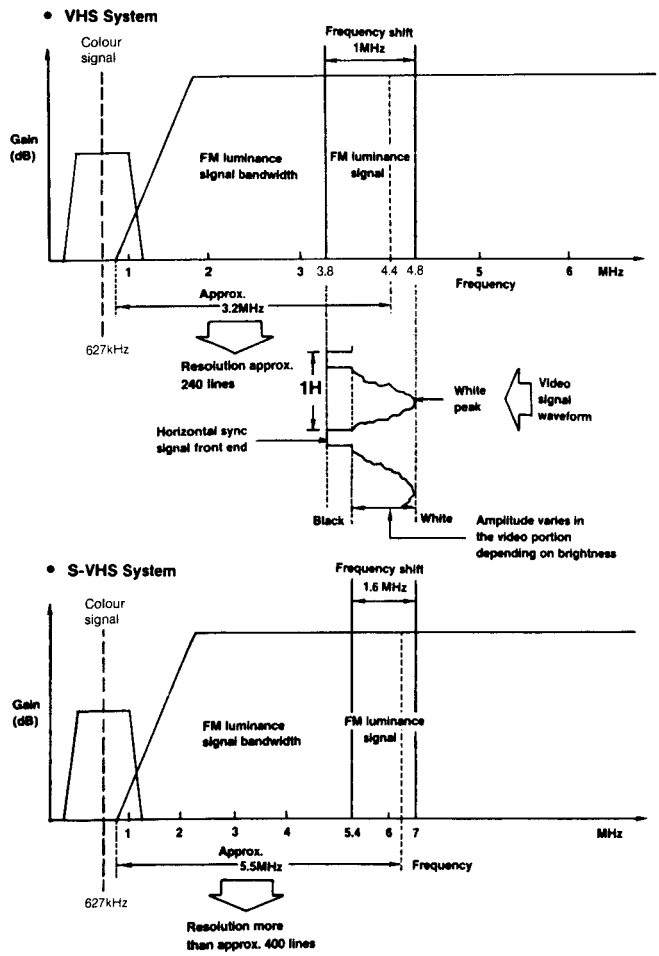
Comparison between S-VHS and VHS

As compared with the conventional VHS system, the performance is remarkably improved as follows.

- Frequency shift: 3.8 MHz ~ 4.8 MHz to 5.4 MHz ~ 7 MHz
- FM luminance bandwidth: Approx. 3.2 MHz to approx. 5.5 MHz
- Resolution: Approx. 240 lines to more than 400 lines

However, when the band is widened, the S/N becomes inferior accordingly. To prevent this deterioration, in the S-VHS system, the following measures are incorporated.

- The sub-emphasis circuit is introduced in the preliminary stage of the conventional main emphasis circuit.
- An S-VHS tape made of newly developed magnetic material is used exclusively for the S-VHS.
- The use of the amorphous heads ensures high quality pictures.



High Quality Picture

Incorporation of detail enhancer

During VHS mode a picture with fine details, such as ripples on the surface of water or a woman's long flowing hair, tends to be reproduced flat. The detail enhancer circuit enhances the high-frequency signals (more than 1.5 MHz) of such pictures before they are recorded, thus enabling every detail to be reproduced clearly (4 dB up).

HD (high-dynamic) System

This unit records audio using the following two formats:

- **Hi-Fi sound:** An FM format employing a dedicated rotary audio head permits high quality sound recording and reproduction.
- **Normal audio:** This is the same format as that used in a conventional video recorder.

<Compatibility with conventional recording methods>

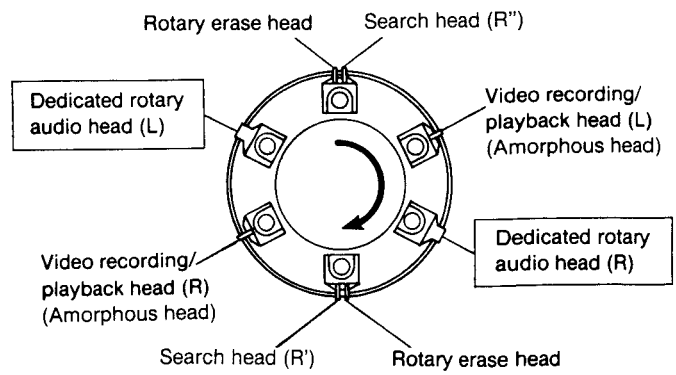
This unit can record tapes in the conventional (normal) mode, enabling tapes recorded on it to be reproduced on a conventional machine.

The unit can also reproduce tapes recorded on a conventional machine.

❶ Independent dedicated audio head installed on rotary cylinder

The audio of a video tape which was formerly recorded using a fixed head is recorded on this unit using an audio head mounted on a rotary cylinder. The video is recorded over the audio using a dedicated video head. This completely new format (Figs. 1 and 2) is called a high-dynamic system (for creating superior sound quality).

Fig. 1


Rotary erase head
Search head (R")
Dedicated rotary audio head (L)
Video recording/ playback head (L) (Amorphous head)
Dedicated rotary audio head (R)
Video recording/ playback head (R) (Amorphous head)
Search head (R')
Rotary erase head

<Rear view>

❷ Use of newly developed audio processing IC

A newly developed Hi-Fi sound IC processes the audio input signals at the optimum level without deterioration. As a result, the dynamic range has been increased from the conventional value of 80 dB to 90 dB, making for impressive dynamic sound.

❸ Deep layer audio recording which does not interfere with the video signal

The dedicated audio heads record a wide frequency band FM signal on a deep layer of the tape. The video signal is recorded over the audio signal using a completely different azimuth angle for the video head. As a result, even though the recording position is the same, the audio and video signals are recorded clearly and without mutual interference. (Figs. 2 and 3)

Fig. 2

- Deep layer recording as seen on the cross-section of the tape

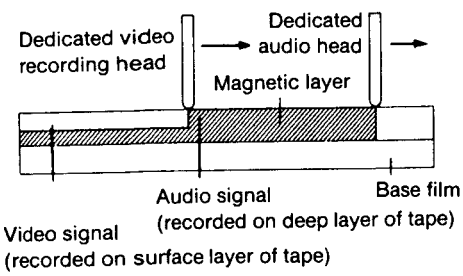
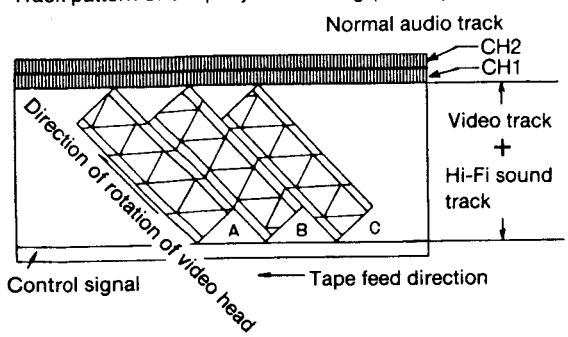


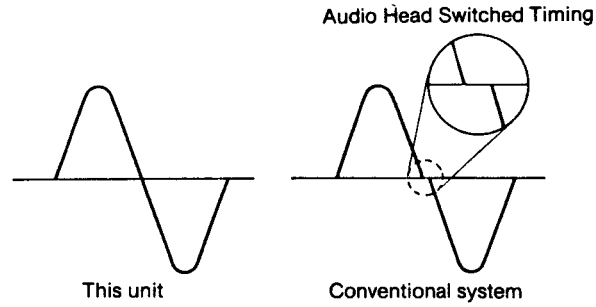
Fig. 3

- Track pattern of deep-layer recording (outline)



❹ Incorporation of switching noise reduction circuit

An electronic switching circuit and an active filter have been incorporated in the noise reduction section which is the heart of the audio circuit. Also audio capacitors and low-noise resistors are used in the level sensor section. As a result, noise which is generated when the audio head (Hi-Fi head) is switched has been greatly reduced, making for highly linear, pure, clear Hi-Fi sound.



Jog/Shuttle Search

❶ Incorporates double DD reel motor

The tape runs smoothly in the forward and reverse directions, and the mechanism has good response.

❷ Variable speed playback by microprocessor control

By using the shuttle dial, the playback speed can be varied according to the angle of rotation of the dial, and by using the jog dial, the playback speed can be varied according to the direction and speed of rotation of the dial. This is useful for frame alignment when searching for the editing points.

Flying Erase (rotary erase) Head

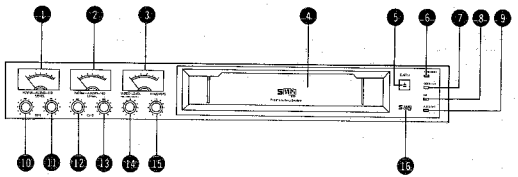
This head is installed ahead of the recording head on the rotary head cylinder. In other words, because only the track on which the recording is to be made is erased by the erase head, there is no noise or over-erasure, and clean simple recording and insert editing can be done without any colour stripe beat being produced.
Also, each rotating head is controlled by a microprocessor, resulting in improved accuracy during editing.

Erasing method	Erase pattern	
	Portion corresponding to beginning of recording	Portion corresponding to end of recording
Full erase using fixed erase head	← Tape travel direction Newly recorded portion Fixed erase head Colour stripes appear due to overwriting of new recording on old recording	Signal has been erased, hence blank portion appears Old recorded portion Newly recorded portion
Flying erase due to rotary head	← Tape travel direction Rotary erase head Newly recorded portion	Picture is joined cleanly Newly recorded portion Old recorded portion

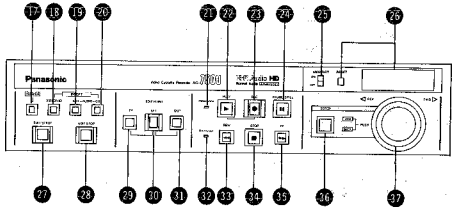
CONTROLS AND THEIR FUNCTIONS

Front

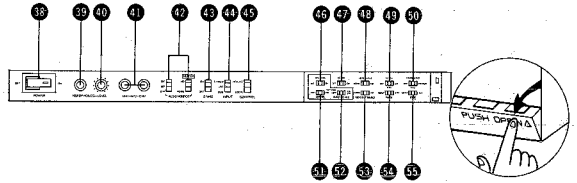
Upper Panel



Middle Panel



Lower Panel



1 Audio (CH1) Level Meter
The meter indication can be switched between Normal/HD by means of Audio Monitor Selector 28.

2 Audio (CH2) Level Meter
The meter indication can be switched between Normal/HD by means of Audio Monitor Selector 28. If you set Audio CH2 Selector 7 (Rear Panel) to the "TIME CODE" side, you cannot use normal audio CH2. In this case, if you set Audio Monitor Selector 28 to the "NORM" side, the audio (CH2) level meter will indicate the existence of a time code signal if present.

3 Video Level/Tracking Meter
When the unit is in the playback mode, this meter functions as a tracking meter. In other modes, it functions as a video input level meter.

4 Cassette Holder

5 Eject Button
Press this button to remove the cassette tape.

6 Time Code Lamp
This lamp lights when the Audio CH2 Selector 7 (Rear Panel) is set to the "TIME CODE" side.

7 Dolby NR Lamp
This lamp lights when you set Dolby NR Switch 49 to "ON".

8 HD Lamp
This lamp lights during HD Sound recording, or playback of a tape which contains HD-recorded Sound.
It also lights when HD Recording Selector 47 is set to "ON" during E-E picture.

9 Auto OFF Lamp
This lamp lights if moisture condenses inside the unit. It flashes when something is wrong with the tape transport (such as tape slack). If this lamp lights or flashes, the unit will stop.

10 Audio (CH1) Normal Audio Level Control
Adjust the recording level of Normal Audio CH1 by turning this control while observing the meter 1.

11 Audio (CH1) HD Sound Level Control
Adjust the recording level of HD Sound CH1 by turning this control while observing the meter 1.

12 Audio (CH2) Normal Audio Level Control
Adjust the recording level of Normal Audio CH2 by turning this control while observing the meter 2.

13 Audio (CH2) HD Sound Level Control
Adjust the recording level of HD Sound by turning this control while observing the meter 2.

14 Video Level Control
MAN: Pull this knob. Adjust the video input level by turning this knob while observing the meter 3.
AGC: Push this knob. The record level is automatically adjusted.

15 Tracking Control
When performing normal playback of a recorded tape, turn the Tracking Control until the reading on the meter 3 reaches maximum.

16 S-VHS lamp
This lamp lights up when the unit is in the following mode;
•Playing back the tape recorded in the S-VHS mode.
•The S-VHS Selector 45 is in the "ON" position during recording S-VHS tape or E-E mode.

17 Assemble Button/Lamp
When you wish to perform assemble editing, press this button to put the unit in the assemble mode. The button contains a lamp which lights when the button is pressed (ON) and goes out when the button is pressed once again (OFF).

18 Insert Video/HD Button/Lamp
When you wish to perform insert editing of a video signal and HD Sound, press this button to put the unit in the insert video/HD mode. The button contains a lamp which lights when the button is pressed (ON) and goes out when the button is pressed once again (OFF).

19 Insert Audio CH1 Button/Lamp
When you wish to perform insert editing of normal audio CH1, press this button to put the unit in the insert audio CH1 mode. The button contains a lamp which lights when the button is pressed (ON) and goes out when the button is pressed once again (OFF).

20 Insert Audio CH2 Button/Lamp
When you wish to perform insert editing of Normal Audio CH2, press this button to put the unit in the insert audio CH2 mode. The button contains a lamp which lights when the button is pressed (ON) and goes out when the button is pressed once again (OFF).

21 Frame Lock Lamp
This lamp lights when the CCIR standard signal is synchronized with the frame during playback or recording.
Before performing editing, confirm that this lamp is lit. (Refer to Frame Servo Switch 48.)

22 Play Button/Lamp
This button is used during tape playback.
(If you press this button together with Record Button 23, the unit will go into the recording mode.)
The lamp lights during playback or recording.

23 Record Button/Lamp
Use this button when you wish to make a recording. When the button is pressed, the lamp will light.

24 Pause/Still Button/Lamp
If you press this button, the lamp will light and tape travel will stop. By pressing it once again, the lamp will go out and the tape travel will start again.
Use this button to create a still picture during playback or to pause during recording.

25 Memory Switch
If you set this switch to "ON", the tape will automatically stop at the point corresponding to "0:00:00:00" on the tape counter when the unit is put in the fast forward or rewind mode.

26 Tape Counter/Reset Button
By pressing the Reset Button, the reading on the tape counter will become "0:00:00:00". Also, the editing point will be reset. When tape travel starts, the counter will provide an indication of the tape travel in Hours : Minutes : Seconds : Frames. When the tape goes past the "0:00:00:00" point and starts to be rewound, the indication on the tape counter will be prefixed by a minus (−) sign.

OPERATING INSTRUCTIONS

27 Edit Start Button/Lamp
This button is used for performing editing (assemble editing or insert editing) after the editing point is set. While editing is taking place, the lamp lights; while a search is taking place at the edit start point and also when the tape returns to the edit end point the lamp flashes.
If you press the Edit Start Button without setting the edit point, you can start editing from the point where you pressed the button.

28 Edit Stop Button
If you press this button during editing, the editing will be finished at the point where you pressed the button.

29 Edit Point In Button/Lamp
By pressing this button together with the Set button, you can set the edit start point.
When the button is pressed, the lamp will light, indicating that the edit start point has been set. By pressing the In Button after setting the edit start point, the edit start point will be displayed on the tape counter. Also, by pressing the Out Button together with the In Button, the editing time will be displayed on the tape counter.
After the end of editing, the lamps of the In Button and Out Button will flash simultaneously, indicating that editing has ended.

30 Editing Point Setting Button
By pressing this button together with the In or Out Button, you can set the editing points.

31 Edit Point Out Button/Lamp
By pressing this button together with the Set Button, you can set the edit end point. When the button is pressed, the lamp will light, indicating that the edit end point has been set. By pressing the Out Button after setting the edit end point, the edit end point will be displayed on the tape counter. Also, if you press the In Button and Out Button simultaneously, the editing time will appear on the tape counter. After the end of editing, the lamps of the Out Button and In Button will flash simultaneously, indicating that editing has ended.

32 Servo Lock Lamp
This lamp lights when the servo circuit is synchronized with the reference sync signal.

33 Rewind Button/Lamp
Use this button when you wish to rewind the tape. While the tape is being rewound, this lamp is lit.

34 Stop Button/Lamp
By pressing this button, the entire unit will stop and the lamp will light.

35 Fast Forward Button/Lamp
Use this button to move the tape forward at high speed. While the tape is traveling forward at high speed, the lamp will be lit.

36 Search Button/Lamp
By pressing this button, the lamp will light and the unit will go into the search mode. By pressing this button once again during a search, the lamp will go out and the unit will revert to the normal playback mode.

37 Search Dial
Use this button to search for the editing points.

38 Power Switch
By pressing this switch "ON", power will be supplied to the unit. Also, the audio CH1, CH2, and video/tracking meter lamps will light, and the reading on the tape counter will be reset to "0:00:00:00". By pressing this switch "OFF", the power will be cut off.

39 Headphone Jack (1/4" phone)
If you connect 8-ohm rated impedance stereo headphones to this jack, you can monitor the audio from either CH1 or CH2, or both channels, in accordance with the setting of the Audio Monitor Selector.

40 Headphone Level Control
For adjusting the output level of the headphones.

41 Microphone CH1/CH2 Jacks (1/4" phone)
For connecting external microphones.

42 Audio Monitor Selector
These switches are used for selecting the type of audio which is output from Audio Monitor Output Jack ⑮ (Rear Panel) and Headphone Jack ㊴, and the channel to be monitored. The indication of Audio Level Meter ❶, ❷ can be switched between Normal/HD by means of the meter side of these selectors.

43 S-VHS Selector
ON: VHS tape and S-VHS tape are automatically distinguished, and recording is done in the corresponding mode.
OFF: S-VHS tape is recorded in VHS mode.

44 Input Signal Selector
This switch is used for selecting the video input signal.

45 Control Selector (Remote/Local)
REMOTE: Set the switch to this position when connecting a controller to the Remote Control Connector ⑭ (Rear Panel). When the switch is in this position, the operation buttons on the unit will be rendered inoperative, and the unit will be controlled by the remote controller. Also, the counter cannot be reset. (The Stop Button and Eject Button will function, however.)
LOCAL: Set the switch to this position when using the unit independently.

Note:
When you change the setting of this switch from local to remote, the editing points will be reset.

46 Dolby NR Switch
By setting this switch to the "ON" position, the Dolby NR System will operate.

47 HD REC Switch
ON: HD sound and normal sound are recorded.
OFF: Only normal sound is recorded.

48 HD REC INPUT Selector
NORM: Normal input signal is recorded on HD track.
HD: HD input signal is recorded on HD track.

49 NOTCH Selector
Normally use the selector in the "OFF" position.
- Place this selector to "ON", when playing back S-VHS tapes recorded on other VTRs or when chrominance noise appears in the luminance signal (Y/C signal is not separated completely).
- When the tapes recorded through the S-VIDEO input connector or recorded on the AG-7500 are played back, set the selector to the "OFF" position. More clear picture can be obtained.

50 Frame Servo Selector
OFF: Recording or editing input signals other than CCIR standard signals.
Set the selector to this position when performing insert editing or assemble editing onto a tape that has been recorded using a VTR which does not have a frame servo function.
When the selector is put in this position, Frame Lock lamp ㉑ will go out.
FRAME: Recording or editing CCIR standard signals. When the frame servo is applied, Frame Lock lamp ㉑ will light.
COLOUR: Recording or editing CCIR PAL COLOUR signals. When the colour frame servo is applied, Frame Lock lamp ㉑ will light.

51 Audio Limiter Switch
By setting this switch to the "ON" position, you can record the Normal Audio signal without distortion even if the audio input momentarily exceeds the reference level. (Normal Audio recording only)

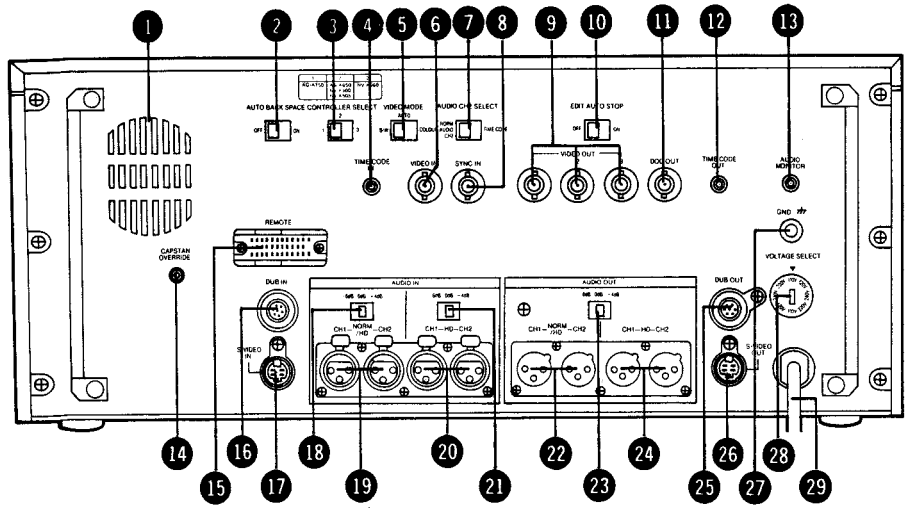
52 Audio Mix Rec Selector
ON: Normal CH1 and CH2 inputs are mixed and recorded on normal CH1 audio track.
OFF: Normal CH1 and CH2 are recorded separately.

53 Audio Output Selector
NORM: Normal Audio is output from Audio Output Jacks ㉗, ㉘.
HD: If HD Sound is recorded, HD Sound will be output. If HD Sound is not recorded on the tape, Normal Audio will be automatically output from Audio Output Jacks ㉗, ㉘.

54 Image Selector
NORM: Normally place the selector in this position.
DETAIL: More clear picture will be obtained than "NORM".
However, the S/N becomes inferior.
EDIT: Place the selector to this position when editing.
However, the S/N of both source and editor VTRs becomes inferior.

55 Sync Selector
This selector is used when recording or playing to select one of two types of sync signals (normal or external).

Rear



1 Fan Motor

2 Auto Back Space Selector
At "ON", spliced recording with out blank on the picture can be done in REC PAUSE mode.

3 Controller Select
When using an optional editing controller or remote controller, set this selector to a position corresponding to the controller used.

4 Time Code Input Jack
Connect this terminal to the output terminal of a time code generator when you wish to record time code signals. Set the Audio CH2 Selector 7 to "TIME CODE".

5 Video Mode Selector
Used to avoid mistaken operation with the colour/black & white automatic selector circuit.
B/W: The unit is forcibly set to black & white mode.
AUTO: Distinguishes automatically between Black & White and Colour video input signals or playback video signals.
However, depending on the signal, select either "B/W" or "COLOUR" if the automatic selector circuit does not operate properly.
COLOUR: The unit is forcibly set to colour mode.

6 Video Input Connector
Connect the video signal to be recorded, such as a video camera, to this terminal.

7 Audio CH2 Selector
When recording or playing back a time code signal, set this switch to the "TIME CODE" side. When the selector is set to this side, you cannot use CH2.

8 Sync Input Connector
- Connect this connector to a composite sync signal from a reference sync signal generator when synchronizing the unit with an external reference sync signal.
- To connect advance sync from TBC.

9 Video Output Connector
Connect this to a TV Monitor, video recorder, or time base corrector.

10 Edit Automatic Stop Selector
By putting this selector in the "ON" position, the VTR will automatically stop in the event that a servo disturbance occurs during editing.

11 DOC Output Connector
When it is connected, a dropout detection RF signal will be output. Connect this to the DOC Input terminal of a time base corrector.

12 Time Code Output Jack
Connect this jack to the input jack of a time code reader and play back time code signals.
Set the Audio CH2 Selector 7 to "TIME CODE".

13 Audio Monitor Output Jack
You can obtain the audio output selected by Audio Monitor Selector 42 from this terminal.

14 Capstan Override Jack
Use this jack when connecting with the Editing Controller AG-A800.
Connect this jack to the CAP OVERRIDE Jack of the AG-A800 when synchronizing the capstan with the recorder (or player) during editing.

15 Remote Control Connector
When you wish to operate the unit from a remote location, connect the optional Remote Search Controller NV-A505 to this Connector. Alternatively, when you wish to perform editing, connect an optional Editing Controller (AG-A750, AG-A650, NV-A500 or NV-A960).

16 Dubbing Input Connector
Using the optional 7P dubbing cable (AG-C65), connect this to the Dubbing Output Connector of the source (playback). Note that you cannot connect this to the dubbing connector of a 3/4" VTR.

⑰ **S-VIDEO Input Connector**
This is a 4P input connector of separated brightness signal and colour signal.

⑱ **Normal Audio Input Level Selector**
This selector can be set to −6 dBs, 0 dBs and +4 dBs in line with the level of the signals supplied to the Audio Input (CH1/CH2) Jacks.

⑲ **Audio Input (CH1/CH2) Connectors**
These input connectors accept signals from external audio equipment such as a tape recorder, record player, etc.

⑳ **HD Sound Input (CH1/CH2) Connectors**
These input connectors are intended exclusively for recording HD Sound.

㉑ **HD Audio Input Level Selector**
This selector can be set to −6 dBs, 0 dBs and +4 dBs in line with the level of the signals supplied to the HD Sound Input (CH1/CH2) Jacks.

㉒ **Audio Output (CH1/CH2) Connectors**
Connect these connectors to audio (stereo, etc.) equipment using audio cable. You can select either Normal Audio or HD Sound using the Audio Output Selector ㊸ on the front panel.

㉓ **Audio Output Level Selector**
This is the selector for audio output level (−6 dBs, 0 dBs or +4 dBs).

㉔ **HD Sound Output (CH1/CH2) Connectors**
These output connectors are intended exclusively for HD Sound.

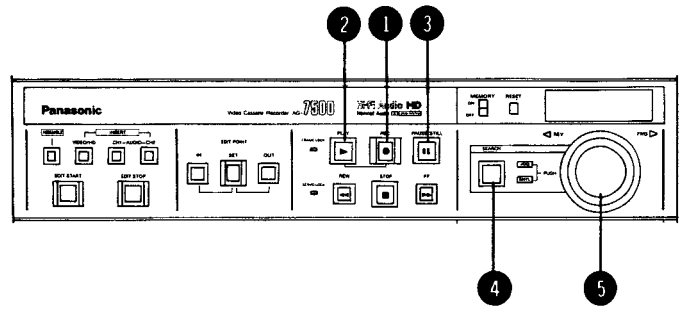
㉕ **Dubbing Output Connector**
Connect this to the Dubbing Input Connector of an editor using the optional 7P dubbing cable (AG-C65). You cannot connect this to the dubbing connector of a 3/4" VTR.

㉖ **S-VIDEO Output Connector**
This is a 4P output connector of separated brightness signal and colour signal.

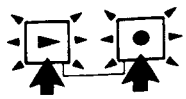
㉗ **Ground Terminal**
If hum occurs, connect this terminal to the ground terminal of equipment connected to the unit.

㉘ **VOLTAGE Select Switch**
When using this unit, make sure that the available voltage is selected correctly, before connecting the power cord to an AC outlet.

㉙ **Power Cord**



■ Recording



Press the Record Button ❶ together with the Play Button ❷. While recording is taking place, the lamp is lit.

■ Playback

Press the Play Button ❷. During playback, the lamp is lit.

- Normally, set the Sync Selector to "NORM".
- During playback, if an input video signal matches the playback video signal, the Frame Lock Lamp will light. (Only when the Frame Servo Selector is set to "FRAME" or "COLOUR".) See page 19.

■ Pause

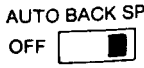
If you press the Pause/Still Button ❸ during recording or playback, the tape travel will stop, and the lamp will light.

During Playback

If you press the Pause/Still Button ❸ while playback is taking place, the tape travel will stop, and a still picture will appear.

- If you wish to cancel the still picture, press the Pause/Still Button ❸ (or Play Button ❷) once again. The tape will move again, and the playback picture will appear.
- To perform recording, press Record Button ❶ and Play Button ❷ simultaneously. The still mode should be cancelled and the unit will go into the recording mode.
- Pause will be released after 5 minutes.

■ Automatic Back Space Recording



Set AUTO BACK SPACE Selector to "ON" side.

- Set in PLAY/PAUSE mode, and push REC Button.

Or,

- Push PAUSE/STILL Button in REC/PLAY.

The tape is rewound about 3 or 5 seconds in the REW direction, and waits.
When PAUSE/STILL Button is pressed, the unit plays for about 3 or 5 seconds, and recording starts.

■ Search Operation

Press the Search Button ❹.
The lamp, Play Button Lamp and Pause/Still Button Lamp will light, indicating that the unit is in the Search Mode.

- If you press the Search Button once again (or Play Buttton ❷) while a search is taking place, the lamp will go out, and normal playback will be resumed.

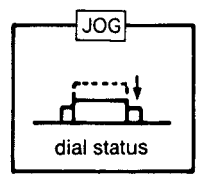
■ Search Dial

Press the Search Button ❹ and the unit is placed in the Search Mode. Then rotate the Search Dial ❺ and search for the desired video. By rotating the dial clockwise, playback will take place in the forward direction (▷lamp lights); by rotating it counterclockwise, playback will take place in the reverse direction (◁lamp lights). By pressing the dial, the Shuttle Mode or Jog Mode will be alternately activated each time the dial is pressed. Also, a lamp at the left of the dial will light to indicate the activated mode.

- You can activate the Direct Search Mode by simply operating the dial, without any need to press the Search Button. (This does not apply to video recording, however.) For details, consult with the shop where you purchased your unit.

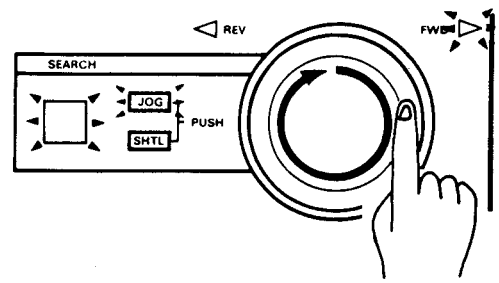
Jog Mode

This mode is used when searching for the editing points in frame units.



The dial has been pressed in slightly.

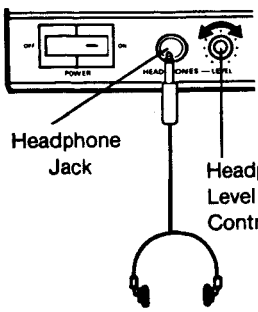
By turning the dial, you can vary the speed from a still picture to 1/5th speed slow playback.
When you stop turning the dial, a still picture will be obtained.



Audio Monitoring

You can monitor audio using one of the following four methods.

❶ When using headphones



When using headphones, you can adjust the volume using this control. To reduce the audio level, move the control to the left, and vice versa.

- Use headphones. (1/4" phone jack)
- If you use high impedance headphones, the audio level may change.

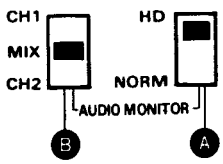
- HD or Normal Sound can be selected as indicates below.

❷ When monitoring audio using the Audio Monitor Jack

The audio selected by the Audio Monitor Selector will be output.

- **Select the monitoring audio using the method ❶ or ❷.**

■ Audio Monitor Selector



You can listen to the audio source selected by two switches (Ⓐ, Ⓑ), using the Headphone Jack or Audio Monitor OUtput Jack.

Ⓔ This switch is used to select the type of audio (HD/Normal) to be monitored. The movement of the pointer of each meter will also change when this switch is operated.

Audio Monitor Selector	Headphone Jack Audio Monitor Output Jack	Audio CH1/CH2 Level Meter
HD / NORM	HD Sound	HD Sound level indication
HD / NORM	Normal Audio	Normal Audio level indication

Ⓕ This switch is used for selecting the audio output signal source.

Audio Monitor Selector	Audio Monitor Output Jack	Headphone Jack
CH1 / MIX / CH2	The audio of CH1 will be audible	
CH1 / MIX / CH2	The combined audio of CH1 and CH2 will be audible	Left side: The audio of CH1 will be audible Right side: The audio of CH2 will be audible
CH1 / MIX / CH2	The audio of CH2 will be audible	

❸ When monitoring audio using the Audio Output (NORM/HD) Jacks (CH1/CH2)

When monitoring audio using the Audio Output Jacks on the back of the unit, you can output the following audio signals using the Audio Output Selector.

Audio Output Selector	Audio Output Jacks	HD Lamp
NORM ■ HD	HD Sound	light
NORM ■ HD	Normal Audio	go out

- When HD Sound is not recorded on the tape, only Normal Audio will be output from the output terminals, even if the selector is set to the "HD" side. Also, at this time, the HD lamp will be out.
- When HD Sound is recorded on the tape, the HD lamp will light even if the selector is set to the "NORM" side.
- When a tape recorded with HD Sound is played back and the tracking control is not set for optimum tracking, normal audio will be output even if the selector is set to the "HD" side. In this case, the HD lamp will be out.

❹ When using HD Sound Output Jacks

When playing back an HD Sound recorded tape, HD Sound will be obtained from these jacks.

But when only normal sound is recorded on the tape, no HD Sound will be obtained from these jacks.

Video Level Adjustment

❶ Set the Input Signal Selector according to the equipment connected to the unit.

To ensure a coloured picture with minimal jitter when dubbing, set the switch to the position which matches the particular application.

S-VIDEO ■ To record video signals from a video source connected to the 4P S-VIDEO Input Connector, set the Input Selector to the "S-VIDEO" position.

LINE ■ To record video signals from a video source connected to the Video Input Connector, set the Input Selector to the "LINE" position.

DUB ■ To record video signals from a video source connected to the Dubbing Input Connector, set the Input Selector to the "DUB" position.

Position of Input Signal Selector	Input signal		
	4P S-VIDEO Connector	Video Input Connector	Dubbing Input Connector
S-VIDEO	○	×	×
LINE	×	○	×
DUB	×	×	○

○...Normal ×...Abnormal (cannot be used)

■ Dubbing

Source Unit

To edit the tape by using S-VIDEO Output Connector, Dubbing Output Connector or Line Output Connector, set the Image Selector to "EDIT". A clear picture can be obtained.

Editor Unit

To edit the tape by using S-VIDEO Input Connector, Dubbing Input Connector or Line Input Connector, set the Image Selector to "EDIT".

- **Image Selector at "EDIT"**

Operating Circuit / VTR Mode	Detail Enhancer	Picture Quality Control VR	Noise Cancel Circuit	CNR	YNR
VHS Recording	Action at "OFF".	—	—	—	—
VHS Reproducing	—	Fixed at "ON". Variable at "OFF".	Action at "OFF".	Amount of work decreased at "ON". Action at "OFF".	Action at "OFF".
S-VHS Recording	—	—	—	—	—
S-VHS Reproducing	—	Fixed at "ON". Variable at "OFF".	—	Amount of work decreased at "ON". Action at "OFF".	—

- In reproducing mode, LINE OUT, S-VIDEO OUT are shown.
- After dubbing, put the Image Selector to "NORMAL".

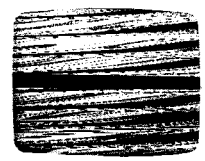
- When using at Image Selector "EDIT"

Recorder Unit	VHS	When recording VTR signal or signal with low S/N
	S-VHS	———
Player Unit	VHS	When recording by other VTR
	S-VHS	When recording by other VTR

- When using at Image Selector "NORMAL"

Recorder Unit	VHS	Camera with high S/N with no high range correction, etc.
	S-VHS	———
Player Unit	VHS	When sending out TV monitor, etc.
	S-VHS	When sending out TV monitor, etc.

❷ Set the Sync Selector to one of the two sync signal positions (normal, external).



If sync cannot be obtained, the picture on the TV monitor will be as shown at left. Set the Sync Selector in accordance with the particular application.

The sync signals are switched as shown in the table below.

- When Sync Selector is set to "NORM"

Input Signal / Application	Video Signal	
	Video signal present	No video present
Recording	Synchronized with video signal	Not synchronized *1
Playback		Internally Synchronized

*1 When only the HD Sound is being recorded, the unit will be synchronized with the internal signal.

- When Sync Selector is set to "EXT"

Input Signal / Application	External Signal	
	Video signal present	No video present
Recording	Synchronized with external signal	Not synchronized
Playback		

- When recording or playing back of HD Sound

Input Signal / Application	External Signal	
	Video signal present	No video present
Recording or playback of HD Sound	Synchronized with external signal	Synchronized with video/ internal*2 signal

*2 When a video signal exists, the unit will be synchronized with the video signal. When a video signal does not exist, it is synchronized with the internal signal.

<Caution>

If you operate this switch during recording or playback, the reproduced picture will be disturbed. Do not, therefore, touch this switch.

❸ Set the Frame Servo Selector

The Frame Lock Lamp will vary depending upon the position of the Frame Servo Selector, as shown below.

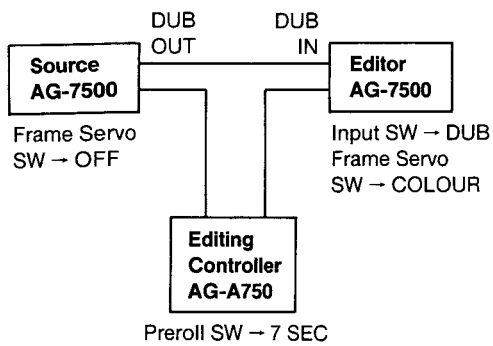
Frame Servo Selector	Frame Lock Lamp
OFF ▭■▭ COLOUR FRAME	⋮▭⋮ light
If the input signal is met with the CCIR standard.	
OFF ▭■▭ COLOUR FRAME	⋮▭⋮ light
If the input signal is met with the CCIR standard PAL COLOUR.	
When the VTR is used as a source VTR during editing.	
OFF ▭■▭ COLOUR FRAME	▭ go off
If the input signal is not met with the CCIR standard. (A rondom interlaced video camera, etc.)	

When the tape not recorded on this unit or the AG-7450 portable recorder is used, framing may not be matched. Be sure that the camera output signal is also met with the CCIR standard PAL COLOUR.

■ Switch settings and lamps used to perform colour framing editing

Ⓐ DUB editing

To perform editing using the dubbing (7-pin) cable, connect the respective units as shown below.

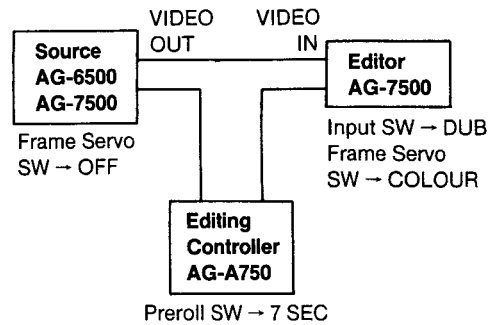


<Caution>

- Set the preroll time of the AG-A750 editing controller to "7 SEC".
- Use colour framed tapes in both the source and editor units. (e.g. tapes recorded using AG-7450 or 7500)

Ⓑ LINE editing

To perform editing using the BNC cable, connect the respective units as shown below.



<Caution>

- Set the preroll time of the AG-A750 editing controller to "7 SEC".
- Use a colour framed tape in the editor unit. (e.g. a tape recorded using AG-7450 or 7500)
- Use a colour programme tape in the source unit. This tape need not be colour framed.

Notes for Colour Framing

- When reviewing to check the Frame Editing after editing, the source unit is in the pause mode and the editor changes over to the internal synchronisation condition. Therefore, the Frame Lock Lamp is off the whole time. Please check the colour framing at the Editing-In and -Out points in the review mode on the screen of the monitor.
- The following are remarks on the Colour Framing Editing, however, they do not matter in the ordinary editing system.

Editing via Video Input Connector

1) The input video signal should be a CCIR standard PAL colour signal.
2) Set the preroll time of the Controller AG-A750 to 7 seconds.
3) The tape in the editor should be recorded by colour framing the CCIR standard PAL colour signal.
4) Both tapes in the source and the editor should have continuity of the colour rotation in all editing sections. (There should not be any assemble or insert editing.)

Editing via Dubbing Input Connector

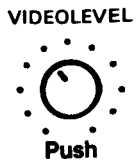
1) All remarks mentioned in "Editing via Video Input Connector" apply here as well.
2) Furthermore, it is necessary that the tape in the source unit is also well colour framed.

How to check whether colour framing was performed on a tape or not

1) Insert the tape that you want to check into the AG-7500 and set the Frame Servo Switch to "COLOUR".
2) Input the standard CCIR PAL signal via the Video Input Connector and playback the tape.
3) If the Frame Lock Lamp lights up, the recording on the tape is colour framed.

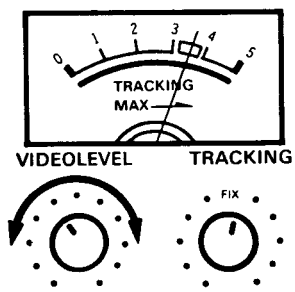
❹ Adjust the video level.

For a normal picture, push in the Video Level Selector (AGC).



When the switch is set to this position (pushed in), the recording level of the video will be automatically adjusted. At this time, the Video Level Control will not function.

When using the switch in this position (pulled out), adjust the Video Level control so that the pointer of the level meter indicates a suitable level (center of the blue line).

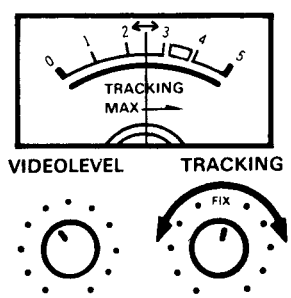


❺ Adjust the tracking.

Normally, set this control to the click stop at the center when playing back a tape.

When playing back a tape which was recorded on another video recorder, noise may appear on the TV monitor In such a case, perform the following adjustment.

1) While playing a pre-recorded tape, slowly turn the Tracking Control left and right until the deflection of the pointer of the tracking meter becomes maximum (moves to the right).

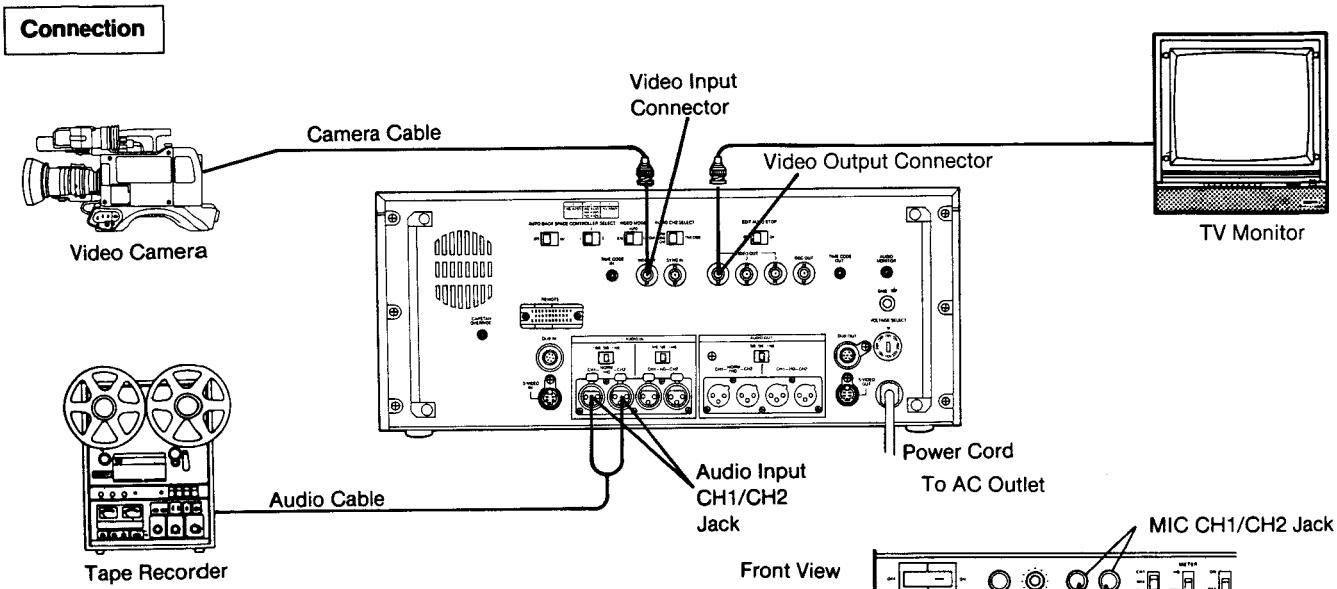


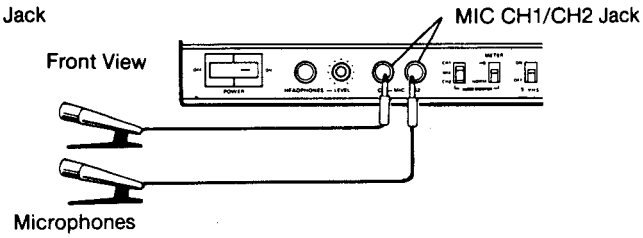
2) Leave the control in that position and continue to watch the picture.

3) Upon completion of playback, always return the Tracking Control to the center click stop.

RECORDING/PLAYBACK USING A VIDEO CAMERA

Connection



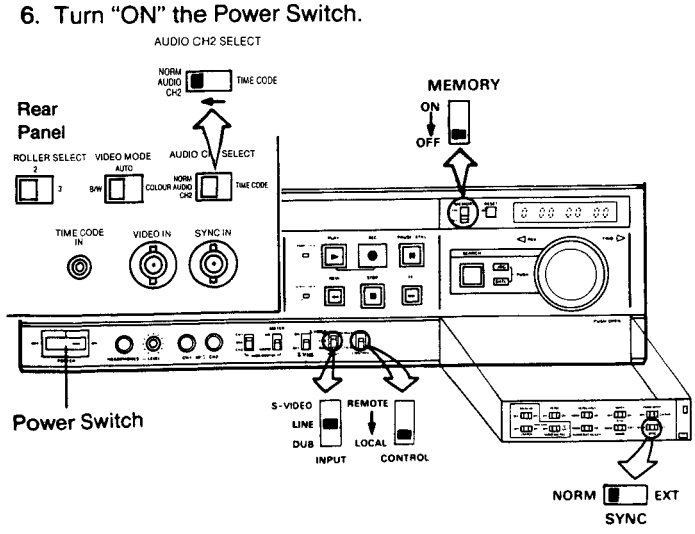


<Caution>

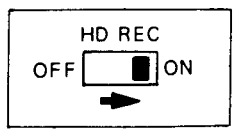
- The Mic jacks are on the bottom row on the front panel.
- Do not connect both the microphone and audio (line) inputs to the video recorder at the same time. If you do this, only the output from the microphones will be recorded.

Switch Setting

1. Set the Sync Selector to "NORM".
2. Set the Control Selector to "LOCAL".
3. Set the Input Signal Selector to "LINE". (See page 17.)
4. Set the Memory Switch to "OFF".
5. Set the Audio CH2 Selector to "NORM AUDIO CH2".
6. Turn "ON" the Power Switch.

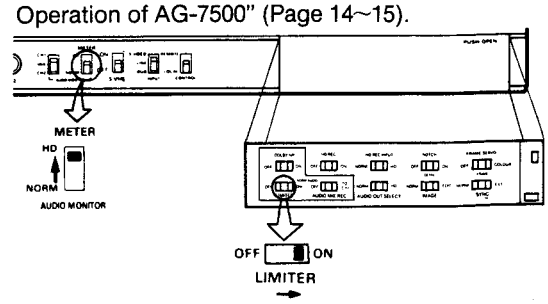


- When you wish to record HD Sound as well, set the HD Recording Selector (Front panel ㊼) to "ON".



Operating Procedure

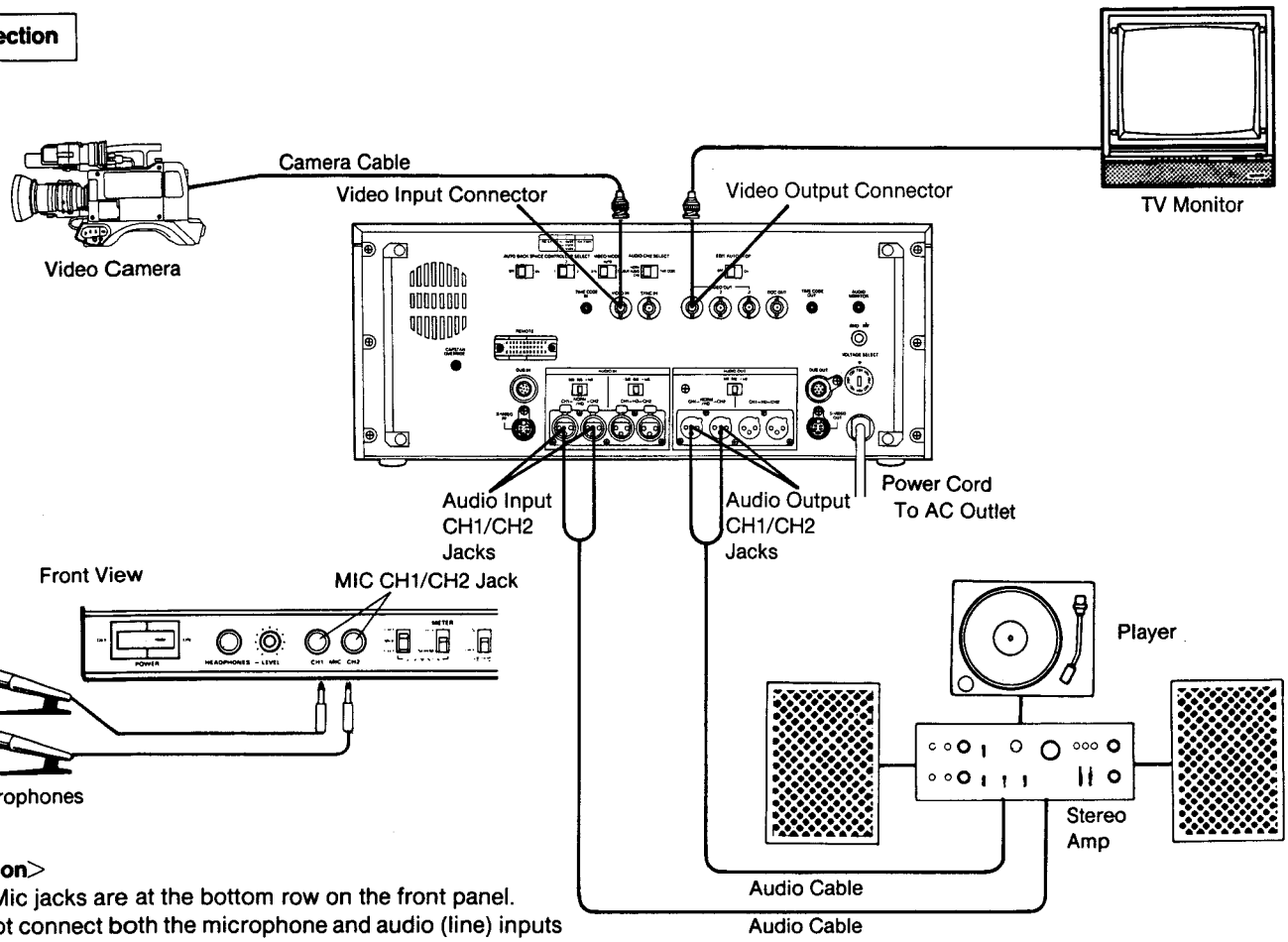
1. Turn "ON" the TV monitor.
2. Load a cassette tape.
3. Adjust the video camera.
4. Adjust the video level. (See page 20.)
   - For automatic operation, push the Video Level Selector for "AGC".
5. Adjust the Audio CH1 and CH2 Levels. (See page 16.)
   - By setting the Audio Limiter Selector to "ON", the audio limiter will be activated.
     This is useful for controlling the amplitude of input peaks from a microphone input.
6. For details of recording, playback, etc., see "Basic Operation of AG-7500" (Page 14~15).



- When you wish to record HD Sound as well
  1) Set the HD Recording Selector (Front panel ㊼) to "ON".
  2) Set the Audio Monitor Selector (METER side) to "HD".
  3) Adjust HD Sound level CH1 and CH2.
     When the input level from Audio Input Jacks is +4, 0 or −6 dBs, by setting the Audio Level Control to the center click point, you can perform recording at the optimum level (0 VU). (See page 16.)

EDITING USING THE AG-7500

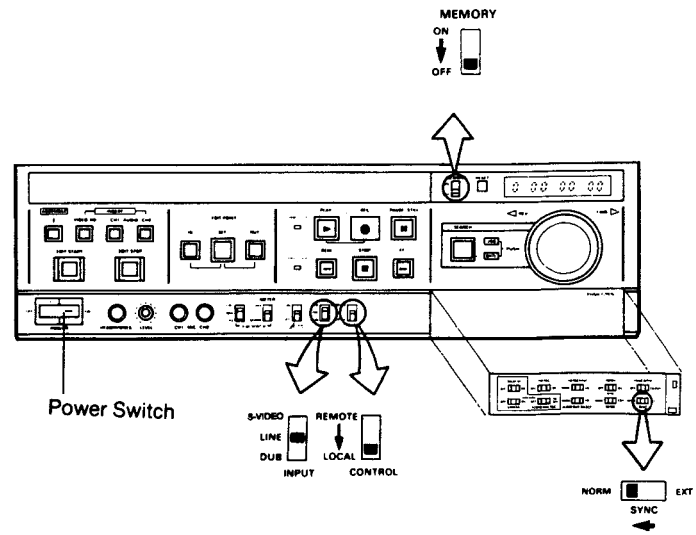
Connection



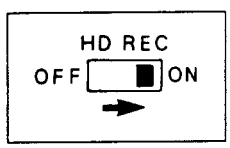
<Caution>
- The Mic jacks are at the bottom row on the front panel.
- Do not connect both the microphone and audio (line) inputs to the video recorder at the same time. If you do this, only the output from the microphones will be recorded.

Switch Setting

1. Set the Sync Selector to "NORM".
2. Set the Control Selector to "LOCAL".
3. When connecting above, set the Input Signal Selector to "LINE".
   When using the S-VIDEO Input Connector, set the selector to "S-VIDEO" and when DUB Input Connector, set to "DUB" according to input mode. (See page 17.)
4. Set the Memory Switch to "OFF".
5. Turn "ON" the Power Switch.



When you wish to record HD Sound as well, set the HD Recording Selector to "ON".



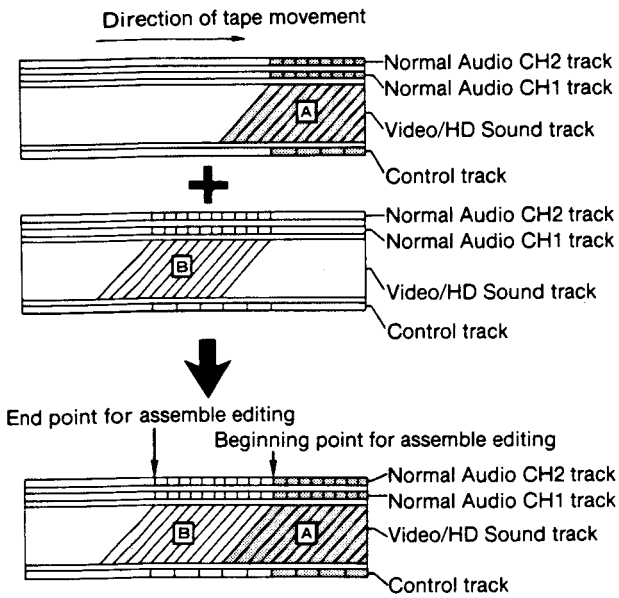
For details of the operating procedure, read Pages 23~28.

EDITING OPERATION (ASSEMBLE)

■ Assemble editing

"Assemble editing" permits the user to add programme material to the end of a previously recorded portion, thus making one continuous, uninterrupted program from many segments. Video/HD Sound (CH1/CH2) and Normal Audio CH1 and CH2 are all edited at the same time. As shown in the illustration, suppose that part A had been previously recorded. To this, a new portion B is added. This results in a new programme consisting of A and B.

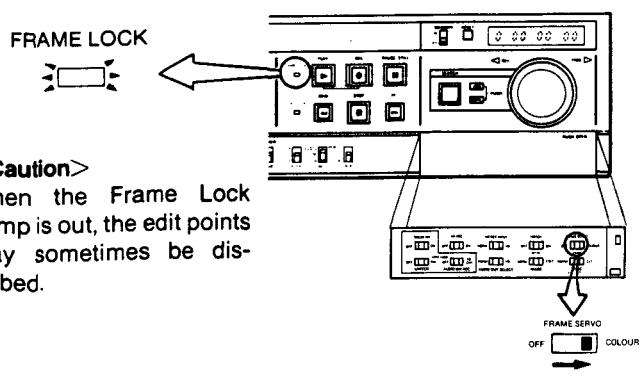
•You can set the HD Sound to ON or OFF by using the HD Recording Switch.



Pre-Operation Checks

•Is the cassette record tab broken? If the tab is broken, editing will not take place.
•Were preparations and connections completed prior to editing? (See page 16~22.)
•Is the Control Selector set to "LOCAL"?

•Ensure that the Frame Lock lamp lights under the following conditions.
1) Play back the tape on which you wish to perform editing.
2) Turn the Tracking Control on the source until the indication on the Tracking Meter becomes maximum.
3) Set the Tracking Control on the editor to the click stop at the center.
4) Set the Frame Servo Selector on the editor to "COLOUR".



<Caution>
When the Frame Lock Lamp is out, the edit points may sometimes be disturbed.

Operating Procedure

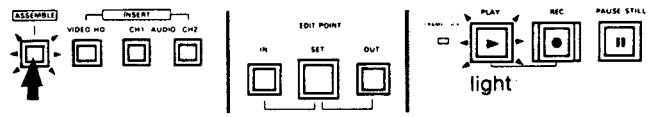
1. Press the Power Switch "ON".

2. Load the cassette tape.

3. Check the programme to be edited using a TV monitor.
   •Press the Play Button. The signals already recorded on the tape will be played back. By pressing the Record Button while playback is taking place, you can observe the E-E signals which you are trying to record. This will take place for as long as the button is kept pressed. These signals will not be recorded on the tape, however.

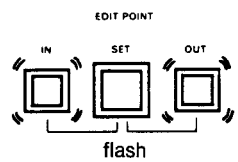
4. Verify that the Play Lamp or both the Play Lamp and the Pause/Still Lamp are lit.
   Press "ON" the Assemble Button.

   •The button is a self-illuminating type. When it is pressed, it will light; by pressing it again, it will go out.



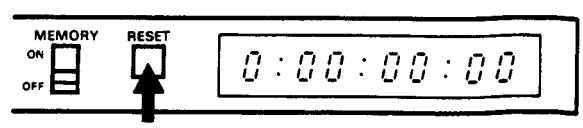
If you attempt to start editing by pressing the Edit Start Button without selecting the editing mode, the four Editing Mode Select Buttons will flash six times, reminding you to select the desired editing mode. After selecting the mode, press the Edit Start Button.

•After selecting the editing mode, the In and Out Buttons will flash.

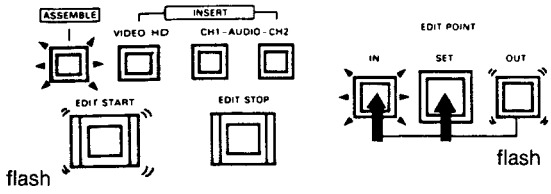


5. Press the Search Button, then using the Search Dial search for the edit In point. Once the In point is found, put the unit in the still mode. (See page 14~15.)

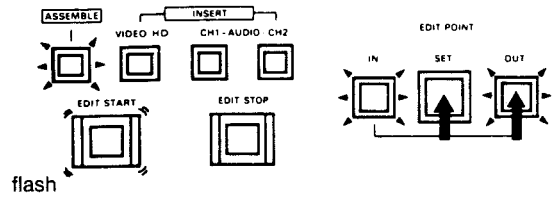
<Caution>
Press the Reset Button on the Tape Counter to reset the counter to "0:00:00:00". When the counter is reset, the previously set edit start and end points will be erased.



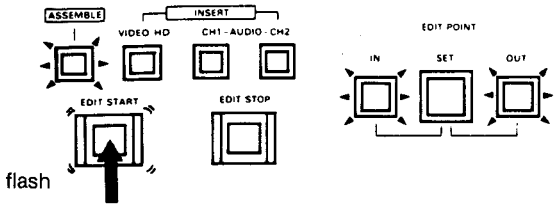
6. Press the In and Set Buttons simultaneously to set the edit start point. When these buttons are pressed, the In Button will light to indicate that the edit start point has been set.
   •At this time, the Edit Start Button will flash.



7. Using the Search Dial once again, search for the edit end point, and when the unit is in a pause status, press the Out and Set buttons simultaneously to set the edit end point. The Out button will immediately light to indicate that the edit end point has been set.



8. Press the Edit Start Button to start editing.

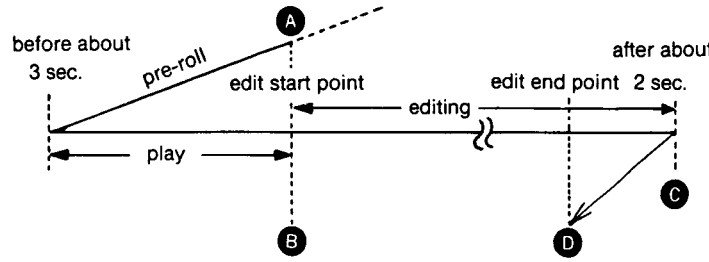


If you wish to perform editing without registering the edit start point or edit end point, see "Registering Edit Points" on page 27.

<Caution>

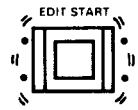
- •When performing assemble editing, it is necessary that the tape be pre-recorded for at least 3 seconds ahead of the edit start point.
  You cannot perform assemble editing starting from a blank section of tape.
- •If there is a portion of the original programme remaining on the tape at the end point of assemble editing, the transition back to the previously recorded programme will not be smooth during subsequent playback.
- •When using a tape to which frame servo is not applied as the source, register the editing start and end points in order to prevent simple recording points from appearing over the editing width, including the pre-roll width.

Editing Procedure



— A point: Press the Edit Start Button to Start Editing —

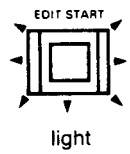
•The Edit Start Button flashes rapidly.



While this lamp is flashing, the VTR pre-rolls back from the edit start point for 3 seconds, and after performing playback for about 3 seconds will reach the edit start point.

— B point: Edit Start Point —

•The Edit Start Button lights.



The lamp lights at the edit start point. At this time, the video and audio signals which are to be edited and recorded will appear on the TV monitor.

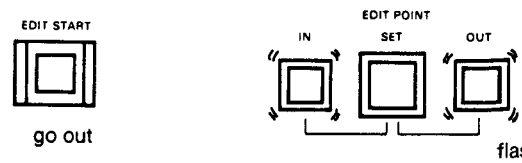
— C point: Pause after recording for about two seconds past the edit end point.

•Once again, the Edit Start Button flashes rapidly.

The video and audio being edited disappear, and the tape returns to the adjacent edit end point.

— D point: Edit End —

•The Edit Start Button goes out, and both the In and Out Buttons flash slowly.



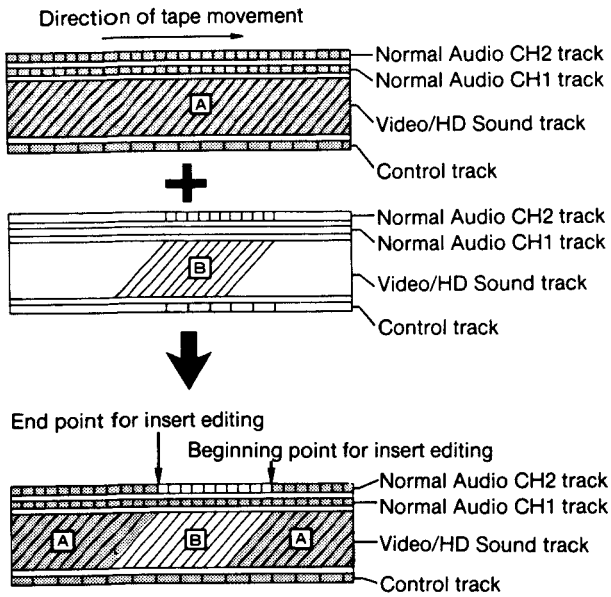
The registration of both the edit start point and the edit end point is cleared, and the tape remains still at the edit end point.

EDITING OPERATION (INSERT)

■ Insert editing

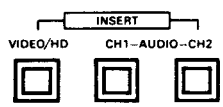
"Insert editing" permits the user to add programme material somewhere in the middle of a previously recorded portion. As shown in the illustration, the new programme material B is added between parts of the already-recorded material A. The result is a new programme consisting of parts A, B, A. For insert editing it is possible to insert only Video/HD Sound (CH1/CH2), Normal Audio CH1, Normal Audio CH2, or any combination of these.

- Video and HD sound cannot be edited separately.
- You can set the HD Sound ON or OFF by means of the HD Recording Switch.



The figure shows insert editing for Video/HD Sound and Normal Audio CH2.

Selecting Editing Mode



Verify that either the Play Lamp is lit or both the Play and Pause/Still Lamps are lit simultaneously, then press the Edit Mode Select Button which selects the signal to be insert-edited.

You can select the signal to be edited using the various combinations shown in the table below.

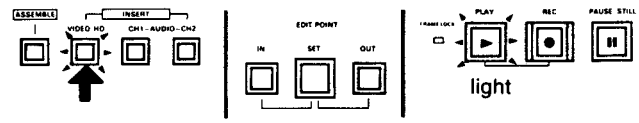
You cannot perform insert editing of HD Sound alone, however.

Editing Signal \ Button	Video/HD	Audio CH1	Audio CH2
Video/HD Sound	ON	OFF	OFF
Video/HD Sound Normal Audio CH1	ON	ON	OFF
Video/HD Sound Normal Audio CH2	ON	OFF	ON
Video/HD Sound Normal Audio CH1/CH2	ON	ON	ON
Normal Audio CH1	OFF	ON	OFF
Normal Audio CH2	OFF	OFF	ON
Normal Audio CH1/CH2	OFF	ON	ON

For details of pre-operating checks, refer to the items on page 16~23.

Operating Procedure

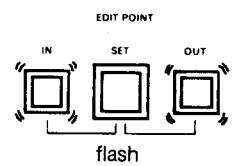
1. Press the Power Switch to the "ON" side.
2. Load the cassette tape.
3. Check the programme to be edited using a TV monitor.
   - Press the Play Button. The signals already recorded on the tape will be played back. By pressing the Record Button while playback is taking place, you can observe the E-E signals which you are trying to record. The E-E signal will be maintained as long as the button is kept pressed. These signals will not be recorded on the tape, however.
4. Verify that the Play Lamp or both the Play Lamp and the Pause/Still Lamp are lit.
   Select the Video/HD, Audio CH1, and Audio CH2 buttons, corresponding to the signals to be inserted.
   (Refer to "Selecting Editing Mode" on this page.)
   - The button is a self-illuminating type. When it is pressed, it will light; by pressing it again, it will go out.



(Refer to "Selecting Editing Mode" on this page.)

If you attempt to start editing by pressing the Edit Start Button without selecting the editing mode, the four Editing Mode Select Buttons will flash six times, reminding you to select the desired editing mode. After selecting the mode, press the Edit Start Button.

- After selecting the editing mode, the In and Out Buttons will flash.

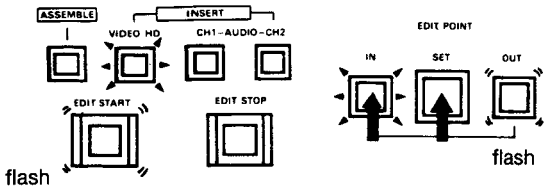


5. Press the Search Button, then using the Search Dial search for the edit start point, and put the unit in the still mode. (See page 14~15.)

<Caution>

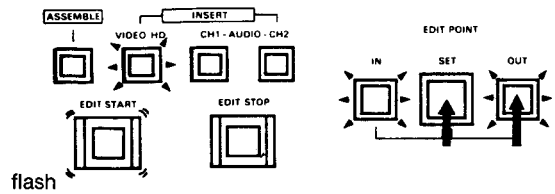
Press the Reset Button on the Tape Counter to reset the counter to "0:00:00:00". When the counter is reset, the previously set edit start and end points will be erased.

6. Press the In and Set Buttons simultaneously to set the edit start point. When these buttons are pressed, the In Button will light to indicate that the edit start point has been set.
   •At this time, the Edit Start Button will flash.



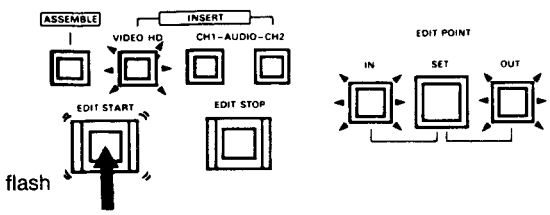
   •The edit in point can be confirmed at any time after it has been entered by simply pressing the In Button.
   See "Checking Edit Set Points" on the next page.

7. Using the Search Dial once again, search for the edit end point, and when the unit is in a pause status, press the Out and Set Buttons simultaneously to set the edit end point. The Out Button will immediately light to indicate that the edit end point has been set.



   •The edit out point can be confirmed at any time after it has been entered by simply pressing the Out Button.
   See "Checking Edit Set Points" on the next page.

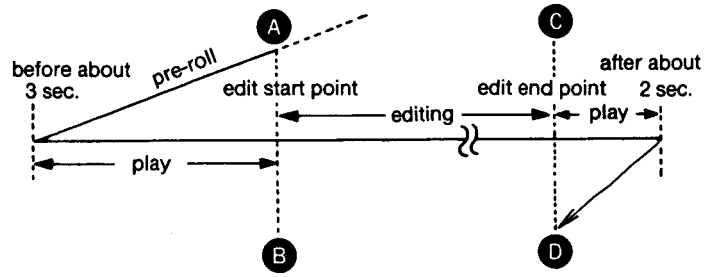
8. Press the Edit Start Button to start editing.



<Caution>

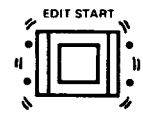
- •This unit can record the S-VHS tape in both S-VHS and VHS modes. Therefore, make sure that the S-VHS Selector on the editor is set to the same mode as the recorded tape when editing. If the insert editing is performed in combination of the S-VHS and VHS modes on the single tape, the mode changing will occur at the edit point, and the fine editing cannot be performed.
- •Rewind the tape by at least 3 seconds from the edit start point until the picture to be played back appears.
- •During insert editing, recording takes place by means of the control signals on the pre-recorded tape. Be sure, therefore, to perform editing on the pre-recorded portion of the tape.
- •Unless tracking is optimum, the rotating head may sometimes prevent clean reproduction from being obtained at the edit start and end point. To prevent this, optimize the tracking before editing. (See page 20.)
- •You cannot perform insert editing of a video signal or HD Sound signal alone. If, for example, you insert only a video signal, the HD previous Sound at that point will be erased.

Editing Procedure



A point: Press the Edit Start Button to Start Editing

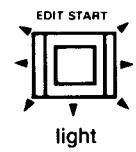
•The Edit Start Button flashes rapidly.



While this lamp is flashing, the VTR pre-rolls back from the edit start point for 3 seconds, and after performing playback for about 3 seconds will reach the edit start point.

B point: Edit Start Point

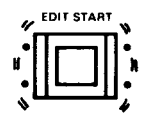
•The Edit Start Button will light.



The lamp lights at the edit start point. At this time, the video and audio signals to be edited and recorded will appear on the TV monitor.

C point: Edit End Point

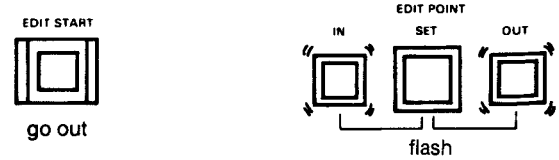
•The Edit Start Button flashes rapidly once again.



The video and audio which were being edited will disappear, and the pre-recorded video and audio will appear and be played back for about 2 seconds. Then the tape will return to the adjacent edit end point.

D point: Edit End

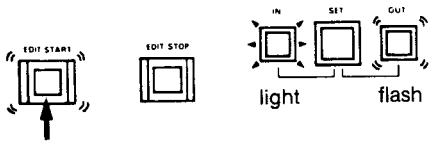
•The Edit Start Button will go out, and both the In and Out Buttons will flash slowly.



The edit start and end point registrations will be erased, and the tape will remain still at the edit end point.

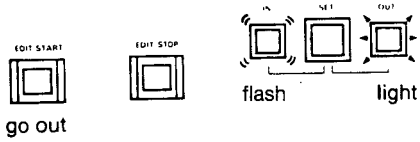
■ Registering Edit Points

•When registering only the edit start point.



During editing, if you press the Edit Stop Button when the desired end position is reached, editing will be performed up to that point.

•When registering only the edit end point



(If only the edit end point is specified, the Edit Start Button will not flash.)

You can start editing from the point at which the Edit Start Button was pressed.

<Caution>

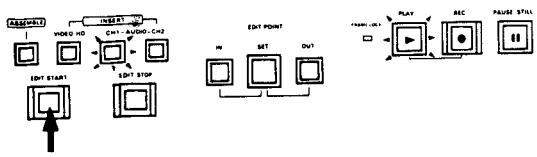
•After registering the editing points, do not set the Control Selector to "REMOTE", because the editing points will be reset.

•When resetting the editing set points
The newly set editing points will take priority, and the previous settings will be automatically erased.

•If the edit start point is not registered, the In button will flash; if the edit end point is not registered, the Out Button will flash.
In this case, re-register the editing points.

■ Cut-in Editing (editing in which pre-rolling does not take place)

If you press the Edit Start Button after selecting the desired editing mode and finding the picture to be recorded during playback, recording will start from the point where the button was pressed. To end recording, press the Edit Stop Button.

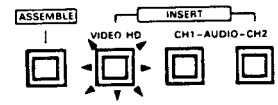


■ Editing by Changing the Editing Mode

While editing is taking place in the Insert mode, you can perform split editing by pressing the Mode Select Button for another mode.

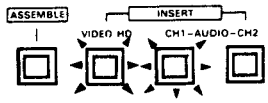
(ex.)

During insert video recording



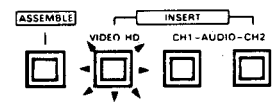
if you press the Insert Audio CH1 Button

Insertion of Audio CH1 will start



if you press the Insert Audio CH1 Button once again

Insertion of Audio CH1 will end, and only the insert video will be recorded.



■ Checking Edit Set Points

By pressing the In Button after setting the edit points, the edit start point will be indicated on the tape counter; by pressing the Out Button, the edit end point will be indicated. If you press the In and Out Buttons simultaneously, the editing time will be indicated on the tape counter.

■ Lap Time Display

By pressing the Out Button together with the In Button after setting the editing points, the lap time will be displayed on the tape counter.

The lap time will be displayed in one of the following ways, depending upon the way in which the editing points are set.

1) When edit start and end points are set
Display indicates lap time between edit start point and edit end point.

2) When edit start point alone is set
Display indicates lap time between edit start point and present tape position.

3) When edit end point alone is set
Lap time is not displayed. The reading on the tape counter is "0:00:00:00".

■ Editing Interruption

•Do not press the following buttons while the Edit Start Button is flickering, that is, after setting the Edit Start points or pressing the Edit Start Button.

STOP·FF·REW·EJECT Button

•Also, do not press the Edit Stop Button when the end point has not yet been reached. If you do press it, editing will be interrupted, and the editing operation will stop without the edit start and end points being erased.

Be sure that the editing operation has been completed before proceeding to the next operation.

•Edit Automatic Stop Selector (Rear Panel)

OFF[■]ON If the servo operation becomes disturbed after the edit start point, the VTR will automatically stop.

OFF[■]ON The VTR will continue operating even if the servo becomes disturbed after the edit start point.
When editing is performed with the unit connected to Editing Controller AG-A750 however, a warning buzzer will sound in the event of a servo disturbance caused by the controller.

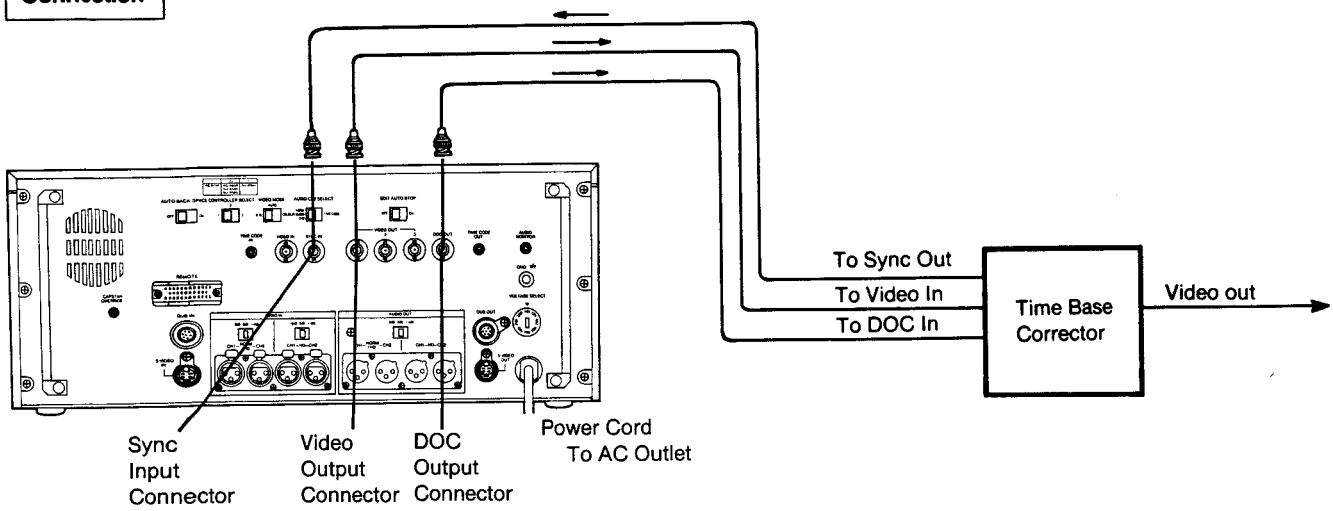
Notes (when assemble or insert editing is executed with this unit only):

- During editing, when the edit OUT point is not entered and the EDIT STOP button is pressed, the position at which the editing is stopped will be entered as the OUT point. The tape will then overrun 8 frames and be edited. Afterwards, the tape will return to the OUT point.
- During normal playback, when editing is started with the EDIT START button, the position at which the button is depressed will be entered as the edit IN point and the unit will start editing 8 more frames after the IN point.

CONNECTING THE UNIT TO A TIME BASE CORRECTOR

You can connect a commercially available time base corrector to this unit.

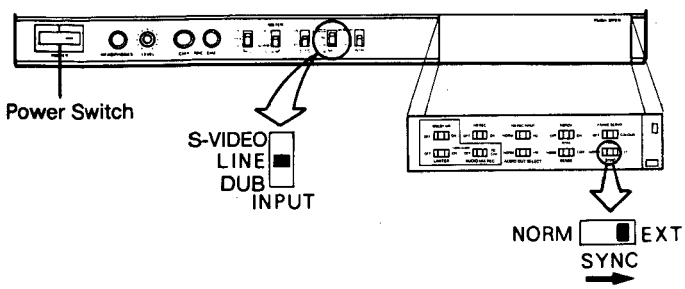
Connection



Switch Setting

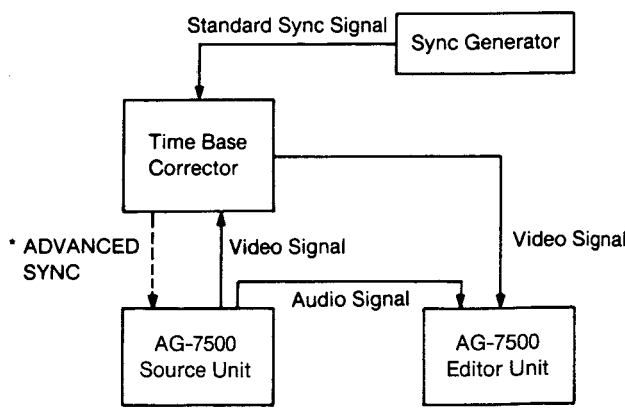
When performing normal playback, or when using the unit as a source (playback) unit for dubbing and editing

1. Set the Sync Selector to "EXT".
   - The unit will be locked to the sync signal of the time base corrector.
2. Set the Input Signal Selector to "LINE". (See page 17.)
3. Set the Power Switch to "ON".



<Caution>
When using a standard sync signal generator, connect the standard sync signal to the composite sync input connector of the time base corrector.

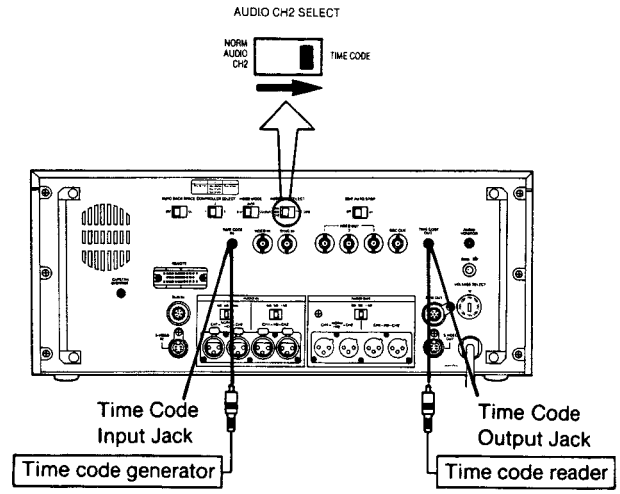
* Connect the sync signal output (ADVANCED SYNC) from the time base corrector to the Sync Input Connector of this unit if required.



CONNECTING THE UNIT TO A TIME CODE GENERATOR AND READER

By recording EBU time code signals on the tape, you can track the absolute position of the tape.
Time code signals will be recorded on the normal audio track CH2 of the tape.

- When recording and playing back time code signals, connect a time code generator and reader to the Time Code Input Connector and the Time Code Output Connector of this unit, respectively. Also, set the Audio CH2 Selector to the "Time Code" position.
  The Time Code Lamp will light.



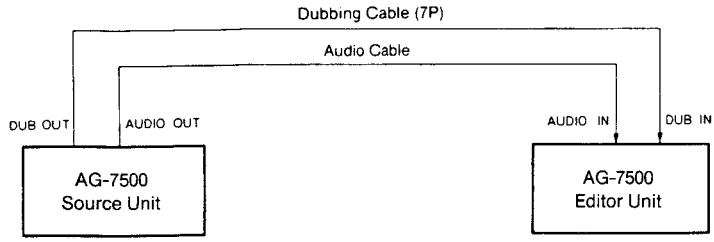
CONNECTING THE CABLES

■ When dubbing, the order of obtaining high quality picture will be as following.

❶ Using 7P dubbing cable. ❷ Using 4P S-VIDEO cable. ❸ Using BNC cable.

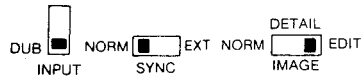
Connecting the Dubbing Cable

Connect the 7P dubbing cable from the source side Dub Output Connector to the editor side Dub Input Connector.



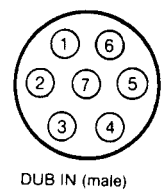
- Main switchings on the source unit.

- Main switchings on the editor unit.



<Caution>
- Normally the "NOTCH" Selector is used in the "OFF" position.
- If you connect two dubbing cables, colour picture will not be obtained. Be sure, therefore, to remove the unnecessary dubbing cable.
- Normally use the IMAGE Selector in the "EDIT" position.

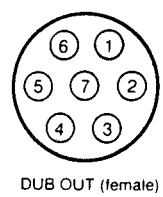
• Function of Dubbing Input/Output Connector (7P)



DUB IN (male)

Dubbing Input Connector

No.	Contents
①	Dubbing Y (Luminance) Input
②	GND
③	Head Switching Pulse Input
④	GND
⑤	Dubbing C (Chrominance) Input
⑥	GND
⑦	Dubbing Control (L) (when connected (L))



DUB OUT (female)

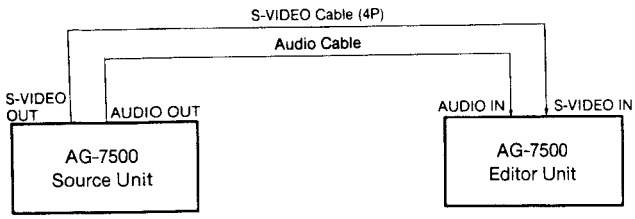
Dubbing Output Connector

No.	Contents
①	Dubbing Y (Luminance) Output
②	GND
③	Head Switching Pulse Output
④	GND
⑤	Dubbing C (Chrominance) + DC Output
⑥	GND
⑦	Dubbing Control (L) (when connected (L))

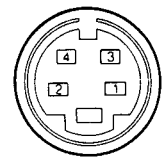
CONNECTING THE CABLES (CONTINUED)

Connecting the S-VIDEO Cable

Connect the 4P S-VIDEO cable from the source side S-VIDEO Output Connector to the editor side S-VIDEO Input Connector.



• Function of S-VIDEO Input/Output Connector (4P)



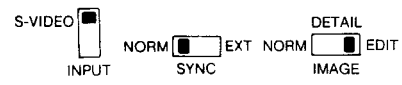
S-VIDEO IN/OUT (female)

S-VIDEO Input/Output Connector

No.	Contents
①	Y GND
②	C GND
③	Y Signal Input/Output
④	C Signal Input/Output

•Main switchings on the source unit.

•Main switchings on the editor unit.



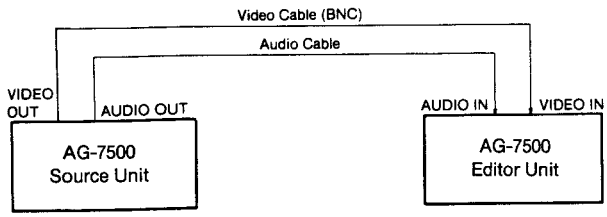
<Caution>

•Normally the NOTCH Selector is used in the "OFF" position. But when playing back tapes not recorded on the AG-7500 with chroma noise on the brightness signal, setting the selector to the "ON" position can decrease the noise.

•S-VIDEO cable has only video signal. Audio must be hooked up separately.

Connecting the BNC Cable

Connect the BNC cable from the source side Video Output Connector to the editor side Video Input Connector.



<Caution>

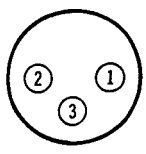
•Normally the NOTCH Selector is used in the "OFF" position. But when the composite signal (BNC) is inputted in colour mode, NOTCH Selector will automatically switch to "ON".

•Main switchings on the source unit.

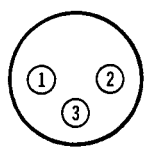
•Main switchings on the editor unit.

Audio Cable

•Function of Audio Input/Output Connector (XLR)



AUDIO IN (male)



AUDIO OUT (female)

Audio Input/Output Connector

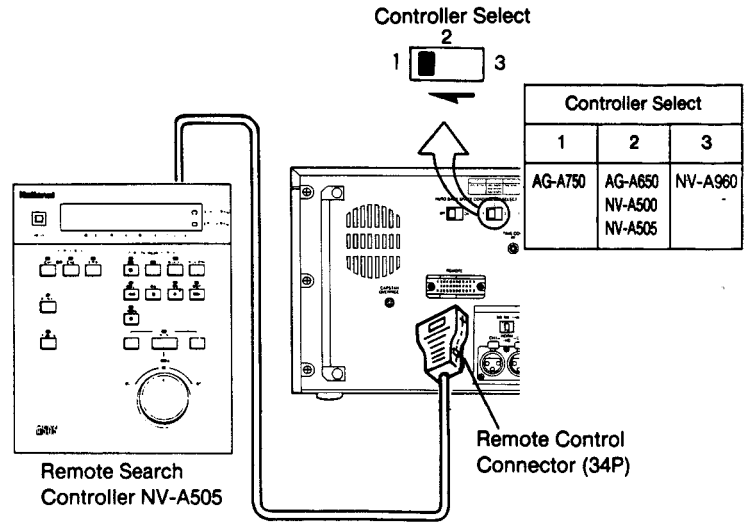
No.	Contents
①	GND
②	HOT (+)
③	COLD (−)

USING REMOTE SEARCH CONTROLLER (OPTION)

By connecting the optional Remote Search Controller NV-A505 to the Remote Control Connector of this unit, you can operate the unit from a remote location.

The remote operation functions which are possible using the Remote Search Controller are editing (assembly and insert editing), recording, playback, fast forward, rewind, pause, 9-mode variable speed forward and reverse playback over a speed range between 0 and 10 times normal speed, and stop. You cannot perform variable speed playback in the JOG mode.

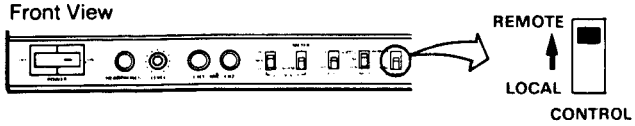
•You can also use remote controller AG-A600. The operating procedure is the same as that for NV-A505.



Controller Select		
1	2	3
AG-A750	AG-A650 NV-A500 NV-A505	NV-A960

Operating Procedure

1. Connect the Remote Search Controller NV-A505 to the Remote Control Connector (34 pin).
2. Set the Controller Select to "2".
3. Set the Control Selector to "Remote". (See page 10.)



•At this time, the operation buttons of this unit will cease to function. (The Stop Button and Eject Button will remain operative, however.)

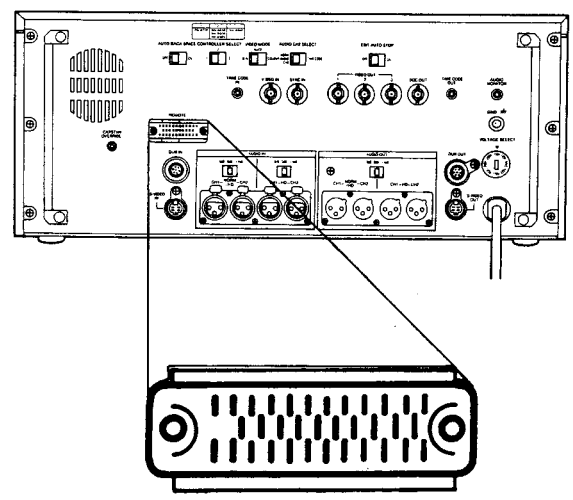
When you connect two or three source (playback) units to the video recorder to make an editing system, you can use the remote search controller as an interface. For details, read the instruction manual for Remote Search Controller NV-A505.

■ REMOTE CONTROL CONNECTOR (34 PIN)

Pin No.	Contents	Pin No.	Contents
1	REC SWITCH	18	CONTROL PULSE OUT
2	PLAY SWITCH	19	REMOTE 19
3	FF SWITCH	20	START MARK
4	REW SWITCH	21	EJECT SWITCH
5	STOP SWITCH	22	INSERT CH1
6		23	REC HOLD
7	PAUSE SWITCH	24	PLAY HOLD
8	CASSETTE IN	25	FF HOLD
9	CUT IN SWITCH	26	REW HOLD
10	NOT SOURCE PLAY	27	INSERT CH2
11	SERVO LOCK	28	
12	GND	29	PAUSE HOLD
13	FRAME ADV. SWITCH	30	REMOTE 30
14	REVERSE COUNT	31	CUT IN HOLD
15	CUT OUT SWITCH	32	INSERT VIDEO
16	EDIT SWITCH	33	REMOTE 33
17	REVERSE	34	+12V

•HOLD signals are output by open collector circuits. Therefore, a user's remote controller circuit for these pins should be designed as an open collector output circuit or with Transistor Transistor Logic (TTL) level.

•Number 34 pin (+12V) should be used only for our remote controller.



REMOTE CONTROL CONNECTOR (34 pin)

EDITING USING EDITING CONTROLLER (OPTION)

By connecting an editing controller AG-A750, AG-A650, NV-A500, AG-A505 to the AG-7500, you can fully utilize the editing functions of the AG-7500, and perform accurate editing.

- **You can use this unit as either a source (playback) unit or an editor.**
- When the preview is performed using the Editing Controller NV-A500, the preview cannot be finished even if the Edit Stop Button is pressed. If this is the case, press the Pause Button to finish the preview.

<Caution>

- **Set the Control Selector to "REMOTE".**
- **Set the Controller Select as shown below.**

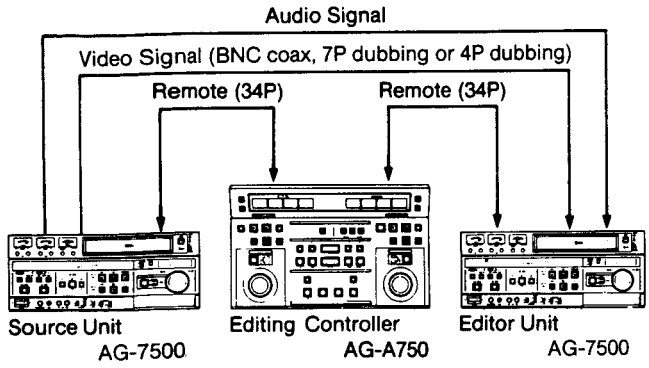
Switch \ Editing Controller	AG-A750	AG-A650 NV-A500 NV-A505	NV-A960
Controller Select	1	2	3

- **When the Controller Select is set to "3", that is, when you are** editing using an NV-A960 controller, the editing accuracy may be reduced.

Using the Editing Controller AG-A750 (option)

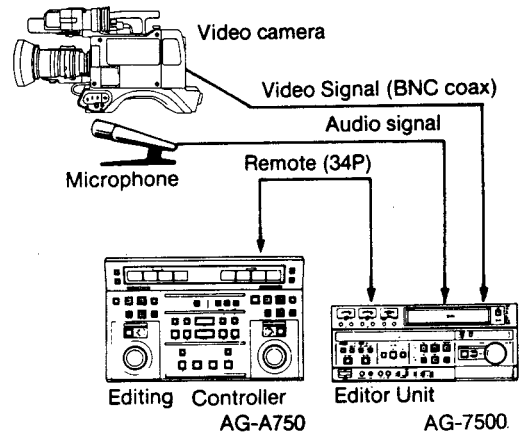
Basic Editing System

This is the basic system for dubbing between a source unit and editor unit when one source unit, one editor unit and the AG-A750 editing controller are used together.



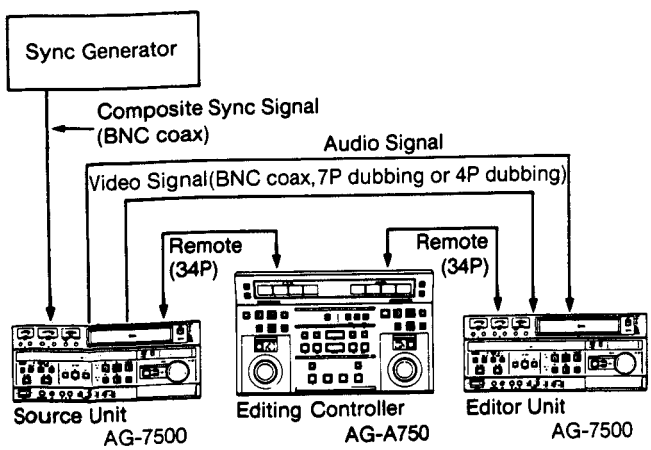
Camera Editing

This is the basic system for editing video signals from a video camera on the editor unit.



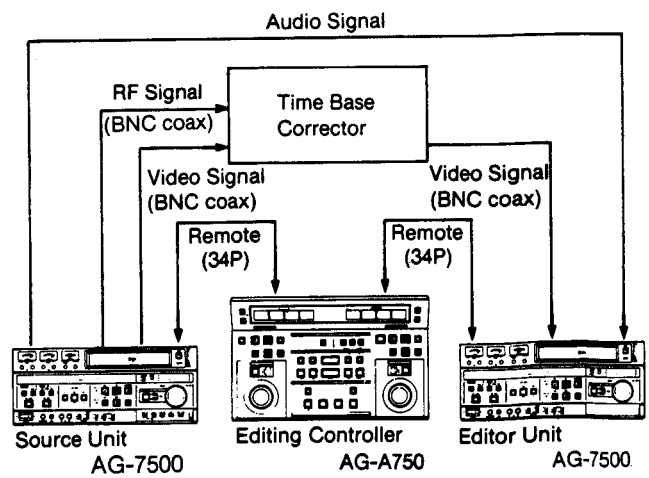
Applying External Sync

You can apply sync to the entire system from an external sync signal generator, making for more stable editing.



Using a Time Base Corrector

The use of an external time base corrector minimizes jitter during editing.



PRECAUTION FOR HANDLING UNIT

■ Vibration

Do not use the unit in a location where there is considerable vibration.

■ Magnetism

Do not bring the unit near magnetic fields or electrical equipment which generates strong magnetic fields.

■ Temperature

Under no circumstances use the unit in a very hot or cold location or a location which is exposed to direct sunlight. This is because the performance of the unit may be degraded.

■ Humidity

Electronic equipment does not readily withstand humidity. Do not install the unit in a very humid location or a place where rain is likely to reach it. Under no conditions allow liquids to spill into unit; extensive damage may occur.

■ Cleaning the unit

Before cleaning the unit, turn "OFF" the Power Switch, and be sure to pull out the Power Plug from the power outlet. Clean the cabinet using a soft cloth. If the cabinet is very dirty, immerse the cloth in a diluted solution of dishwashing detergent, wring it hard, and wipe off the dirt, then finish the cabinet with a dry cloth. Do not use paint thinner or benzine.

■ Storing the unit

1. Do not store the unit in a very hot or cold location.
2. Under no circumstances leave the unit outdoors.
3. Be sure and remove the cassette tape from the unit.
4. To prevent a possible breakdown, when not using the unit for some time turn "OFF" the Power Switch and be sure to withdraw the Power Plug from the power outlet. (Under no circumstances pull directly on the power cord because of the risk of breaking the conductor inside.)

■ Installation Conditions

1. Use the unit in a horizontal position.
2. Do not block the ventilation holes in the unit. To improve air circulation, ventilation holes are provided at the top of the unit. Keep the rear of the unit at least 15 cm, and the sides at least 5 cm, away from any walls. Also, do not block up the ventilation holes underneath the unit with carpet, etc.
3. Before moving the unit from one place to another, be sure and remove the cassette tape.
4. To ensure that the unit can be used without breakdown, do not place objects on top of it.
5. When using the unit on a base, provide a firm base.
6. If you abruptly warm the room in which the unit is installed using a gas stove, etc., or quickly move the unit from a cold place to a warm place, the resulting sudden change in temperature may cause condensation and prevent the tape from traveling properly. As far as possible, therefore, use the unit under conditions in which the temperature does not change abruptly. If condensation occurs inside the unit, the Auto OFF Lamp (condensation indicator) will light, and the unit will stop operating. In such a case, wait until the lamp goes out.

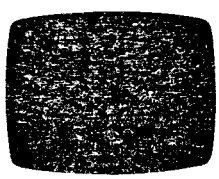
- When using the unit, do not block the ventilating holes at the top.
- When mounting this unit on a rack, use a rack which is provided with a fan.
- In the event of an abnormality, immediately turn the Power Switch "OFF" and remove the Power Plug from the power outlet, then contact the shop where you purchased the unit. If you continue to use the unit without removing the cause of the abnormality, the extent of the fault may increase or an unforeseen accident may result.

CONDITIONS WHICH ARE APT TO BE MISTAKEN FOR A MALFUNCTION

Check the following points and perform adjustment as necessary. If the trouble persists, consult your local dealer.

Condition	Inspection and Adjustment	Reference page
If there is no power to the unit	•Is the Power Plug inserted?	—
If no operation starts when operation buttons are pressed	•Is the Auto OFF Lamp lit or flashing?	36
	•Is the Control Selector set to "REMOTE"? If so, set to "LOCAL".	10
If tape can't be rewound or fast forwarded	•Is the tape already completely rewound or fast forwarded?	—
	•Is the Memory Switch in the "ON" position? If so, set to "OFF".	9
Recording or editing does not take place	•Is the tab on the cassette broken?	—
	•Is the position of the Input Signal Selector correct?	17
If the playback image is grainy	•This is usually caused by a dirty video head.	35
	•Is the Image Selector set to "EDIT" during VHS mode? If so, set to "NORM".	11, 18
If stripes appear on part of the picture during normal playback	•Slowly turn the Tracking Control to the left or right.	20
No colour in playback picture	• Is input signal a colour signal?	—
	•Are two dubbing cables connected? If so, remove one.	30
If the playback picture is disturbed at regular intervals	•Is the vertical sync control of the TV monitor set correctly?	—
	•Is there a supply voltage fluctuation during recording?	—
	•Is the Sync Selector set incorrectly?	18
	•Is the cassette tape in good condition?	—

VIDEO HEAD CLOGGING



Snowy Picture

In the unlikely event that the video heads become dirty enough to be clogged, no picture will be played back. This can easily be determined if, during playback of a known good tape, there is good sound, but no picture (picture is extremely snowy). If this is the case, have the unit checked by qualified service personnel.

Note: We do not recommend that you attempt to clean the video heads yourself.

AUTO OFF LAMP

When the lamp flashes at regular intervals

The lamp will flash if an abnormality occurs while the tape is traveling (if the tape becomes slack, for example).
If the lamp continues to flash when the Power Switch is turned "OFF" and then "ON" again, turn "OFF" the Power Switch again and call the serviceman.
When the Auto OFF Lamp flashes, the tape counter display will change to an error display. In this case, consult with the shop where you purchased your unit.

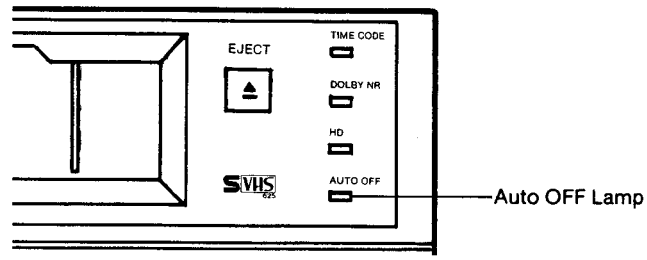
Error Message	Check Points
E-1	LED Indication Trouble
E-2	ELEVATOR Trouble
E-3	LOADING Trouble
E-4	CYLINDER LOCK
E-5	REEL LOCK
E-6	TENSION Trouble

When the lamp flashes at irregular intervals

This is a stopping due to trouble of the fan motor.
Consult your dealer.

When lamp lights

The lamp will light if condensation occurs inside the unit. At this time, the unit will cease to function entirely. In this case, wait until the lamp goes out before attempting to operate the unit.



Dew is formed under the same principle that condensation will form on window panes in a heated room, and it may be evident in the following circumstances:

- When the unit is used in a room in which a stove has just been turned on in winter.
- When the unit is brought into a very humid or steamy room.
- When the unit is abruptly moved from a cold place into a warm room.

A WORD ABOUT THE CASSETTE

■ Types of S-VHS Cassette tapes

Types	Record/Playback Time
NV-SE180E	3 hours
NV-SE120E	2 hours
NV-SE60E	1 hour

Compatibility with conventional recording system
The conventional (normal) recording mode is provided, and the tape recorded by the normal mode can be played back by the conventional video deck. Also, a tape recorded by a conventional deck can be reproduced by this unit.

- In addition to the tapes specified, the recorder will accept any cassette tape which has the S-VHS and the VHS mark.

■ Types of VHS Cassette tapes

Types	Record/Playback Time
NV-E240	4 hours
NV-E180	3 hours
NV-E120	2 hours
NV-E90	1 hour 30 minutes
NV-E60	1 hour

- The tape recorded by the S-VHS system in this unit cannot be reproduced by the conventional VHS video deck.

RACK MOUNT ADAPTOR (Option)

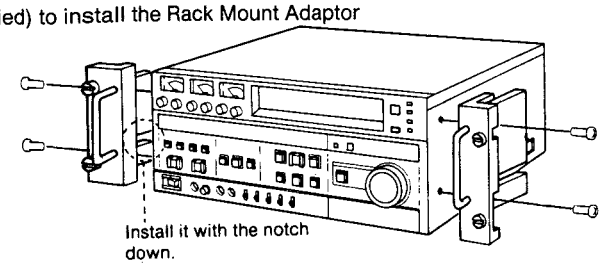
- This adaptor is used to mount the AG-7500 on the IEC 19" standard rack.
- Use the IEC 19" standard rack.
- Use a complete slide rail and bracket unit for 18" length (part No. CC3004-99-0017) or 24" length (part No. CC3004-99-0018) of Chassis Trak.

Accessories

Screws (for slide rails) M4 ..... 4 pcs

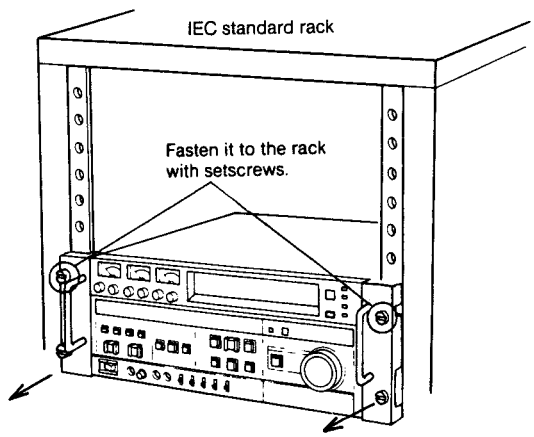
Installation of Rack Mount Adaptor

Remove the screws on the recorder side. Then use the M4 screws (supplied) to install the Rack Mount Adaptor



Mounting onto the rack

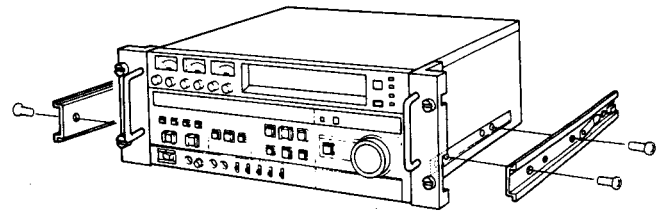
- Remove the rubber legs (4 pcs) from the bottom of the recorder.
- When mounting the recorder on the rack, be sure to install a ventilation fan (air volume of about 3.3 m^3/sec.) on top of the rack.



When using the slide rail, remove the setscrews. The setscrews can be removed by pulling in the direction of the arrow. Keep the remove setscrews, washers and spacers in a proper place.

Installation of slide rails

- Use a complete slide rail and bracket unit for 18" length (part No. CC3004-99-0017) or 24" length (part No. CC3004-99-0018) of Chassis Trak.
  (The complete slide rail and bracket unit is not available from Panasonic.)



- For the details, contact your local dealer.

SPECIFICATIONS

Power Source:	AC 110/120/220/240 V (selectable), 50-60 Hz
Power Consumption:	Approx. 96W Approx. 100W (with AG-A750)

Television System:	CCIR Standard (625 lines, 50 fields) PAL COLOUR signal		
Video Recording System:	2 rotary heads, helical scanning system Luminance: FM azimuth recording Colour signal: converted subcarrier phase shift recording		
Audio Track:	4 tracks (Normal: 2, HD: 2)		
Tape Format:	S-VHS tape, VHS tape		
Tape Speed:	23.39 mm/s (Normal)		
Record/Playback Time:	180 min. with NV-SE180E		
FF/REW Time:	About 3 min. with NV-SE180E		
Heads:	Video: 2 rotary heads Audio/Control: 1 stationary head Erase: 1 full track erase 2 selectable audio erase tracks for editing 2 flying (rotary) erase heads		
Input Level:	S-Video (4P DIN): Y;	1.0 Vp-p,	75Ω unbalanced
	C;	0.3 Vp-p, burst level,	75Ω unbalanced
	Video: VIDEO IN connector (BNC)	1.0 Vp-p,	75Ω unbalanced
	Dubbing In Connector (7P): chroma level	0.9 Vp-p,	1 kΩ unbalanced (SYAN LEVEL)
	luminance level	1.0 Vp-p,	1 kΩ unbalanced
	Audio: MIC ×2	−60 dBv,	4.7 kΩ unbalanced
	LINE IN (XLR)	+4, 0, −6 dBs,	600Ω balanced
	Composite sync: (BNC)	4.0 Vp-p, negative pulse,	75Ω unbalanced
	Time code: (PHONO)	1.0 Vp-p,	10 kΩ unbalanced
	Capstan override: (PHONO)	1,0~10 V	
Output Level:	S-Video (4P DIN): Y;	1.0 Vp-p,	75Ω unbalanced
	C;	0.3 Vp-p, burst level,	75Ω unbalanced
	Video: VIDEO OUT connector (BNC)	1.0 Vp-p,	75Ω unbalanced
	Dubbing Out Connector (7P): chroma level	0.9 Vp-p,	1 kΩ unbalanced
	luminance level	1.0 Vp-p,	1 kΩ unbalanced
	Audio: LINE OUT (XLR)	+4, 0, −6 dBs,	50Ω balanced
	AUDIO MONITOR OUT jack (PHONO)	0 dBv,	600Ω unbalanced
	HEADPHONES jack	−60 dBv~ −20 dBv,	8Ω unbalanced
	DOC out: (BNC)	0.5 Vp-p,	75Ω unbalanced
	Time code: (PHONO)	2.4 Vp-p,	low impedance unbalanced
Video Horizontal Resolution:	VHS: Colour; 240 lines B/W; 300 lines S-VHS: more than 400 lines (Colour, B/W)		
Audio Frequency Response:	50~12,000 Hz (Normal Audio) 20~20,000 Hz (HD Sound)		
Signal-to-Noise Ratio:	Video: 45 dB (Colour) (VHS) 45 dB (B/W) Audio: 48 dB (Normal Audio: Dolby NR ON)		
HD Sound Dynamic Range:	90 dB		
Operating Temperature:	5°C~40°C		
Operating Humidity:	35%~80%		
Weight:	Approx. 21 kg		
Dimensions:	430(W) × 176(H) × 453(D) mm		

*1 Vrms = 0 dBv
*0.775 Vrms = 0 dBs

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.